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Vol. 31 FEBRUARY, 1945 No. 2

# American Journal of Orthodontics and Oral Surgery

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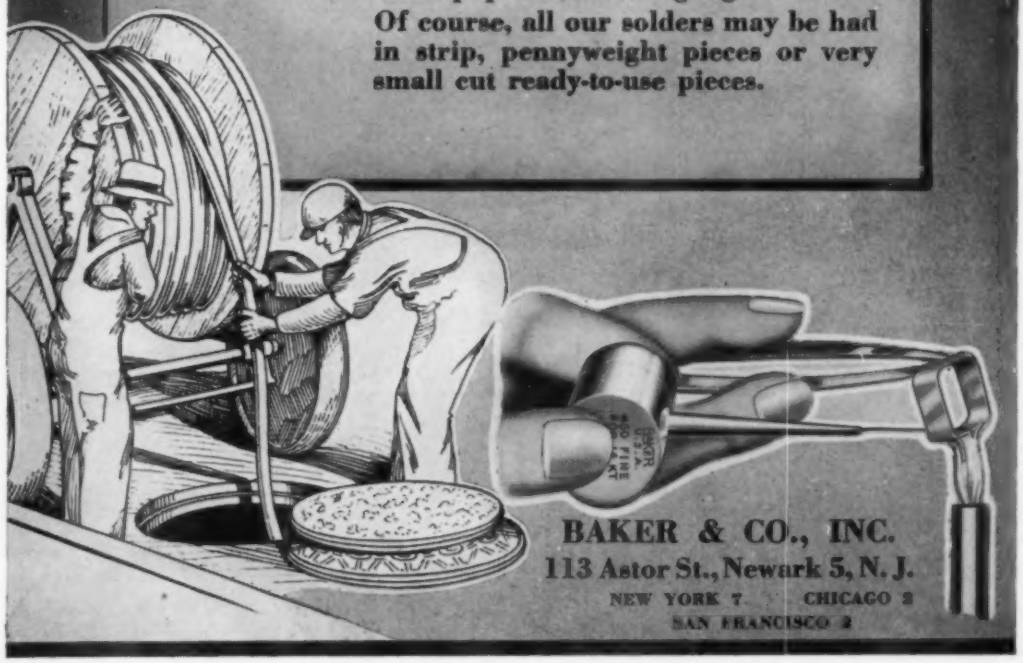

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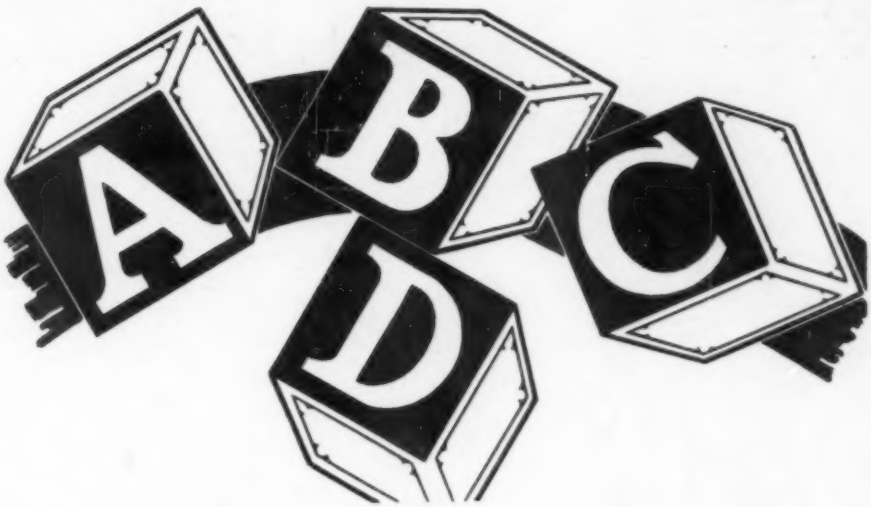


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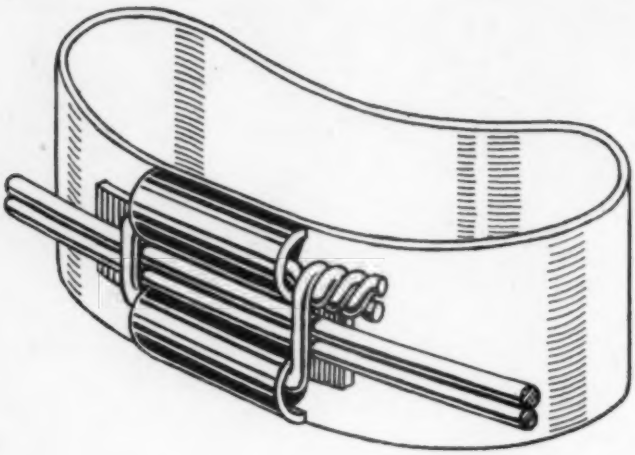

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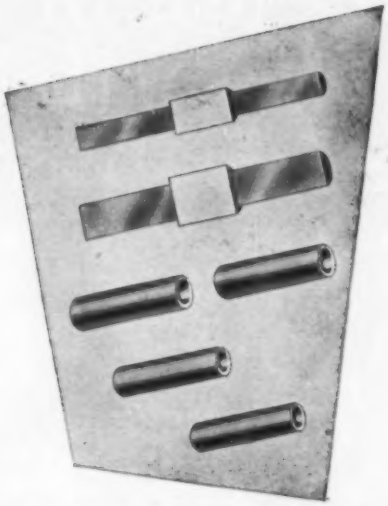

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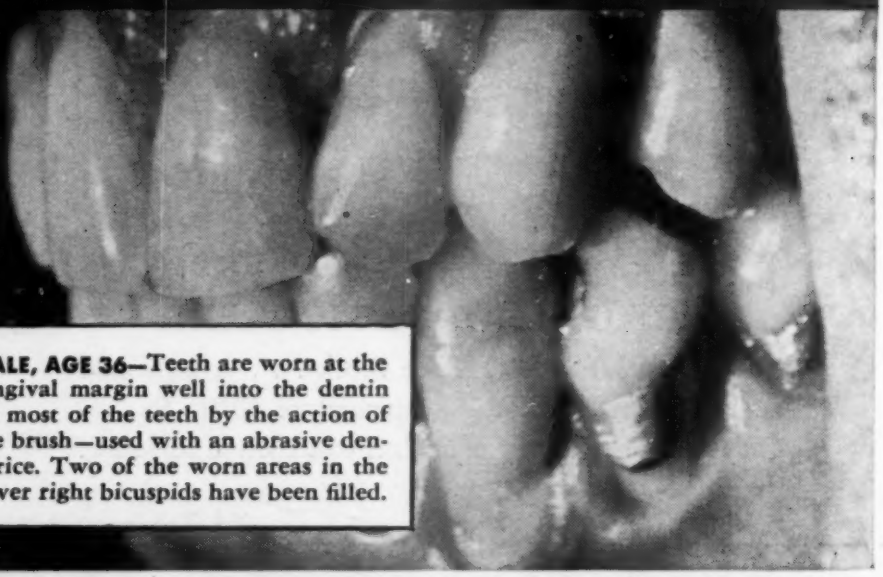

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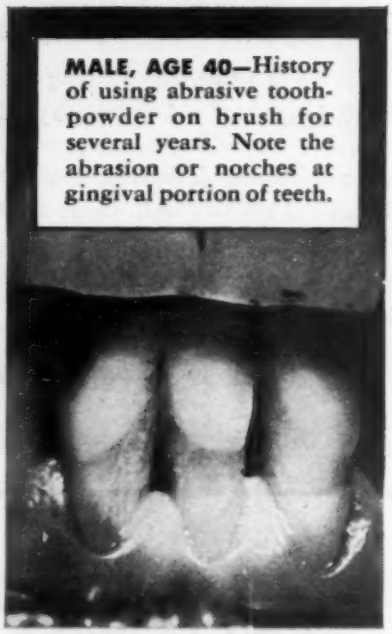

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## Original Articles

# POSTWAR ORTHODONTICS IN THE AVERAGE COMMUNITY

SCOTT T. HOLMES, D.D.S., M.S., MUSKEGON, MICH.

TODAY we are engaged in total war. We are also involved in a great social revolution. Just what this will mean to all of us can be little more than conjectured. No one can predict with complete accuracy. We only know that immense changes are taking place in our whole economic structure, and it would be absurd for us as orthodontists blindly to hope that these changes will have no effect upon us. We might liken our situation to involvement in a terrific storm, with the uncertainties of casualties just as unpredictable. The storm will hit all of us; and although it is a beautiful thought to look for the sunshine after the rain, we cannot lose sight of the fact that the damage and upheaval may be tremendous.

Let us look at the forecast. War is expensive. The debts incurred are beyond average human visualization, but the fact remains that the debts will have to be paid in one manner or another. The immediate payment of debts after the war is quite inconceivable, so it seems reasonable to assume that the debt will be a constant problem for many years to come. Today, surpluses over and above basic living costs are being cut as rapidly as possible, and, by the time this paper is read, governmental procedures may have made considerable changes in our present status. By the time we are through with this war and into the period of readjustment, appreciable surpluses in the family budget will likely be a matter of history.

During the postwar period many plans will be designed to reduce the cost of medical care. Recently proposed legislation on this subject indicates the present trend of thought. These plans may range from the ridiculous to the sublime, and, some place in between, one may be found that will be acceptable

This paper was presented before the American Board of Orthodontics in partial fulfillment of the author's requirements for certification by the Board.

to all parties concerned. If such a plan can be worked out, it may be the answer to the question of postwar orthodontic services. I certainly am in no position to make any prediction and will evade the issue by quoting, "Only time can tell." One condition seems quite evident, however: if the private practice of orthodontics is going to survive the war, it will do so on a greatly reduced potential source of income. This potential source of income will be the surplus in the family budget over and above the basic costs of living.

Recently, the bulletin of the local Merchant Service Bureau presented an interesting article. In part, it stated: "In 1937 the average factory worker earned approximately $1,200 per year or $23.07 per week. In 1942 this same worker averaged $2,700 per year or $52.50 per week. In 1943 he averaged $2,965 per year or $57 per week. In 1937, this $23.07 per week was on a basis of 40 hours per week at 56¢ per hour. Since 1937 he has been increased to 84¢ an hour, but he no longer is working only 40 hours per week, but is working seven days per week or 56 hours. This is the basis of pay, $33.60 for the first 5 days of 8 hours each, $13.44 for the sixth 8 hour day, and $13.44 for the seventh 8 hour day. In other words he is making $23.32 for the two extra days worked each week. The part to think about now is this: What will your customer be earning if the war should end in 1944, or if it should end suddenly? If he works only 40 hours per week, his pay will decrease about $1,200 per year or an amount equal to the total amount that he earned during 1937."

The above paragraph was written for consumption by local merchants, but it gives orthodontists something to think about too.

The reduction of incomes means much to the business side of orthodontics, because most orthodontic services cannot be considered among the absolute basic necessities of life. Some orthodontic patients are forced to seek care because lack of function makes adequate chewing painful or impossible. This may be true in deep overbite cases with impingement on soft tissue, or in extreme Class II or III Angle cases where no functional contact exists between the arches. Another type of orthodontic case seeks care because gross facial disfiguration makes life so miserable from the psychological standpoint that health is impaired. In such selected cases, I believe we are safe in considering orthodontic care in the category of basic necessities. The large majority of our cases, however, have in the past performed, and could continue in the future to perform, enough of the functions of mastication to maintain life. It is true that correction would be highly desirable, but in times of financial stress it could not be considered in the same category as food, clothing, and lodging. These basic necessities must come first.

We orthodontists believe that orthodontic care is a very desirable service for a great many people, and we are convinced that its elimination in the postwar period would be a serious loss to that generation. Under our care we have seen mouth health improved, facial deformities minimized, and distorted personalities corrected simultaneously with their facial corrections. We intend to continue to alleviate the ills of man to the best of our ability. The technique of orthodontic care has improved immensely during the years, and it is our desire to maintain these achievements and continue our progress in the postwar period. In the past, this has been done under the system of private

practice, and I believe most of us hope for a long future in private practice. Proper orthodontic care is exacting, individualistic, and time-consuming, and therefore does not lend itself well to mass production. Standardization of treatment methods, consistent with biologic principles, together with a close scrutiny of the health needs of the patient, may assist us in keeping the cost of orthodontic care within the available surpluses of a reduced family budget in the postwar period.

How are we to conduct our postwar practices so as to maintain high standards of professional technique, and still provide a service that can be paid for out of the reduced surplus in the family budget? It has occurred to me that some light may be shed on the postwar problem by an analysis of the methods used today in handling a similar problem, namely, the orthodontic care of the patient of limited means. I shall attempt such an analysis in my own practice, feeling that many of my patients belong to a classification which makes them good subjects for such a study. My practice is in a very ordinary mid-western community of medium size. This is a "factory town" and the large number of my patients belong to families of limited means. In my study I will place special emphasis on the procedures followed in treating these patients of limited means.

The analysis of a practice may well begin with an inquiry into the philosophy of the operator in relation to his practice. I believe that every practice is built on some philosophy whether the operator recognizes it or not. My philosophy is that an orthodontic practice is successful only when certain objectives have been reached. I will consider these objectives under three main headings and will call them my "Aims of Practice." They are as follows:

1. To provide a service which patients will feel is desirable.
2. To provide a service in which the operator feels that he is completely fulfilling his professional duty to his patients.
3. To provide an income which the operator feels is just and adequate compensation for his services.

In striving to provide a service which patients will feel is desirable, one must not think in terms of the present-day desire and ability to buy, but rather in relation to a reduced buying power. It is evident that in the postwar period the family will not be able to buy all of the extras they now indulge in, and the least desired will be the first to be eliminated. It behooves us to make sure that orthodontic services will stand high on the list of semiluxuries that are particularly desirable; and now is the time to cultivate these desires. Someone has stated that more practices are ruined during good business periods than at any other time, because operators are too busy to consult with and cultivate the confidence of their patients. Our patients and their parents must be convinced that their orthodontic needs are being considered primarily in the light of health requirements. Facial disfigurement is not conducive to the best health of the individual, and therefore, as a guardian of health, an orthodontist must strive to alleviate such a condition.

By virtue of the title of Doctor, an orthodontist is a teacher as well as a guardian of health and must teach health as it relates to growth and develop-

ment of the face and jaws. An orthodontist is not a glorified facial beautician, and in times like these when so many demands are being made upon our time, we must constantly recall that we have other important opportunities besides the insertion and adjustment of appliances.

One of the valuable and desirable services an orthodontist can render is observation and advice during the period of change from deciduous to permanent dentition. I believe an orthodontist should handle as many of these observation cases as possible, because each is another opportunity to stress the fact that he is a teacher and counselor on mouth health. If we teach our patients the proper meaning of dental health now when we are seeing a large number of patients, then we need have no fear as to the desirability of orthodontic services in the postwar period.

In providing a service which patients will feel is desirable, one becomes aware of many different desires on the part of patients and their parents. With special reference to patients whose income is limited, one often finds that their desires for improvement are by no means as restricted as their incomes. Many of these people are among the most ambitious, progressive, pleasant, and intelligent patients one would ever hope to serve; while others are motivated by a desire to do only the very minimum that health and average appearance demands. The service which we provide should be flexible enough to include all these varied desires in so far as it is physically possible and consistent with good treatment and biologic principles. Desires on the part of the patient are natural and commendable. They are not always capable of fulfillment, but unless the prospective patient has desires, it follows that he is not apt to be a very desirable patient. Once the desire is activated in the mind of the patient, it is the orthodontist's duty to analyze the case and instruct the patient and parent in the possibilities of attainment. If the patient's desires are vague or impossible to fulfill, then the orthodontist is in position to guide and cultivate the patient's desires to the end that proper solution of the problem can be planned.

The second aim of my practice is to provide a service in which the operator feels that he is entirely fulfilling his professional duty to his patients. One of the first things I consider in contemplating orthodontic care for the patient of limited means is the degree of perfection desirable in the individual case. If the degree of deviation from normal is rather slight, and the personality of the patient indicates that the closest proximity to perfection that I can attain is the desired end, then I think in terms of idealism for this patient and try to work out a method of achieving that end.

If the degree of deviation from normal is great, then I first determine the absolute minimum correction necessary to bring about occlusal harmony and balance and then add as much to this minimum as is feasible under the circumstances. In considering minimal treatment methods, one basic rule should be established. The rule is this: whatever treatment is planned for the patient, no matter how small the service or how diminutive the fee, the operator must be reasonably sure that the patient will derive lasting benefit from the treatment.

For example, let us consider a bimaxillary protrusion case with fairly even alignment of all anteriors except for an upper central incisor locked

lingual to the lowers. The patient is particularly disturbed by the position of the upper central incisor. If it is financially impracticable to treat the bimaxillary protrusion but within the means of the patient to move the upper central incisor labially, then the orthodontist is justified in doing the latter for the reason that the service will be of immediate and lasting benefit to the patient.

This same rule should be applied to all minimal treatment procedures and so-called preventive measures. Let us consider the use of the removable inclined bite plane in early developing pseudo-Class III conditions which are, in reality, Class I conditions with the upper anterior teeth locked lingual to the lowers. In patients of meager incomes I often use the bite plane without any other appliance. After the upper anteriors are well over, I usually extract the lower first deciduous molars to influence some lingual drift of the lower anterior segment and somewhat increase the overbite. My experience with this method gives me reasonable assurance of success, so in selected cases I am justified in using it, even though I know that other more involved and more expensive methods offer greater opportunities for a more nearly ideal result.

In early developing Class II, Division 1 cases with impingement on the soft tissue, I occasionally resort to the use of a removable bite plane on the upper arch without supplementary appliances. If these cases are fully treated at an early age, a subsequent period of involved treatment is often required after the eruption of all permanent teeth. In patients of limited means, the bite plane is often sufficient to relieve the patient's discomfort so that treatment can be deferred until enough permanent teeth have erupted to complete the treatment in one stage of full appliance therapy. This procedure has the economic advantage of not only relieving the parents of most of the cost of one period of active treatment, but it also gives them ample time (if they are of the worthy type) to anticipate the ultimate cost and to prepare for it.

In the early care of severe bimaxillary constriction cases where one is sure the arches can never be sufficiently expanded without producing unsightly toothiness and possibly bimaxillary protrusion, I use a method of treatment which I believe fulfills the dictates of the rule. In these cases, at the time of eruption of upper and lower permanent central and lateral incisors, I extract all four first deciduous molars. Utilizing this space, I then align the upper and lower anteriors and correct the overbite if necessary. As soon as the first premolars begin to erupt, they are in turn extracted. I have not used this method in enough cases to justify any broad statements but so far this procedure has produced very good results with minimum of operative time.

A similar method for early treatment of extreme Class II, Division 1 cases without extremely deep overbite has proved effective. The procedure, briefly, consists of extraction of upper first deciduous molars, followed by distal and lingual movements of upper permanent central and lateral incisors and deciduous cuspids into functional contact with lowers. The upper arch is retained with a Hawley appliance, and upper first premolars are extracted as soon as they begin to erupt. After eruption of all permanent teeth, the end result is usually very acceptable without further treatment. The greatest diffi-

culty arises in the development of irregularity in the lower arch, and an effective subsequent treatment consists of extraction of lower second premolars and alignment of the arch. This is in accord with previously stated program of caring for minimal requirements and then adding to this as much as is feasible in the individual case.

Judicious disking of the distal of lower deciduous second molars in mildly developing Class II cases, or even their early extractions in some cases, abides by this rule. Devices for breaking thumb, finger, tongue, lip, and cheek biting habits also fall in this category.

Certain appliances for correcting mouth-breathing may sometimes follow the rule, but in my hands most of these methods, such as the use of latex rubber mouth vestibule diaphragms and mouth tabs to be worn at night, have not been very successful.

Treatment of severe Class II, Division 1 cases with long periods of elastic stress illustrates a method of treatment in which I have found that my earlier methods did not live up to the above rule. Too many of the cases did not possess the required permanency of correction. Therefore, I have changed my method; I am extracting many more premolars in these cases, and now feel that my results show a higher degree of stability and permanent benefit to the patient.

Now let us also consider the bimaxillary constriction case where the operator is reasonably sure that no permanent correction can be accomplished without multiple extractions and rather involved mechanics. In the light of my stated rule, in this case the operator is not justified in expanding the arches and temporarily improving the anterior alignment merely to bring the cost within the ability of the patient to pay. The patient should be thoroughly appraised of the facts and arrangements should be made to treat the case either properly or not at all. Temporary esthetic improvement alone leads only to subsequent disillusionment of the patient and unfavorable reflection on the orthodontic professsion.

In trying to predetermine, in my own mind, the orthodontic needs of the patient, I take more into consideration than merely the anatomical configuration of the face and dentition. The personal psychology and apparent intellectual potentialities of the patient also influence my decision a great deal. In dealing with patients of limited means, I not only feel perfectly justified in making this survey of the patient's requirements on a basis of the above-mentioned factors, but I feel that it is my duty. The parent comes to me for advice in the proper care of the child's mouth, and I recognize that no matter what treatment I advise, the cost of such care is apt to be a financial burden. Am I justified then in forgetting all the other needs of this family and influencing them to invest only in theoretical idealism in this one child's mouth? I am reminded of a recent editorial by Dr. Pollock in the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY. He writes: "There is some difference of opinion as to exactly when a malocclusion can be regarded as completely corrected for all practical purposes when it is still short of normal occlusion. Very few persons, including those who have had correction (five years later) and those who have not, have ideal normal occlusions." The basic health

needs of the patient should receive primary consideration, and following this, one should determine how much more can be done for the general well-being of the patient without overburdening the family budget. This same procedure is frequently used by the dentist in considering the general dental needs of an operative patient. It is generally considered that a well-made Class II gold inlay is superior to a well-made Class II amalgam. Accepting this as a fact, it would be absurd, I believe, to state that in every instance the inlay would be the filling of choice. In patients of limited means I believe the operator is duty bound to think first of the health needs of the patient, and in many instances the amalgam would serve his health needs very well without overtaxing his resources.

In this connection, what is this thing called health? Health is an intangible thing. It is a state of well-being, of feeling good, physically and mentally. Lawrence J. Henderson, professor of biochemistry at Harvard, in discussing health, states that it "is getting people into a state which is good enough for their purpose, which does not trouble them, so that they can forget about it."

In relation to health, esthetics must be considered in so far as great deviations from normal appearance are not conducive to the patient's feeling of well-being. The psychological reactions of the patient play a tremendous role. In some cases, minimum consideration of esthetics is perfectly adequate; whereas in others, the same degree of correction would be sadly inadequate. With patients of limited means we must determine their adequate requirements, but we must not oversell idealism to a patient who does not have the mental capacity to enjoy this degree of perfection. If a person feels that he is investing considerably more than he can afford in a service or commodity that he finds difficult to fully appreciate, the task of paying may become such a burden that it may literally kill the enjoyment of possession.

Finally, then, in fulfilling my professional duty to my patients I must first of all plan a service which will be of lasting benefit to the patient. The necessities of treatment must be determined on a basis of health requirements in relation to functional occlusal harmony and balance, and the degree of perfection sought must depend not only on anatomic potentialities but upon the intellectual and psychological requirements of the individual patient.

My third "aim of practice" is to provide an income which the operator feels is just and adequate compensation for his efforts. Just and adequate compensation is a rather indefinite statement, and rightfully so. This is a question which should be decided by each individual operator. In my case I have set a goal which I feel is an adequate and just net income for me in this community.

I have a complete credit report and a fairly accurate estimate of the income of many of my patients. From this material I have estimated my average patient's ability to pay. I also know the fixed overhead costs of conducting my practice. The next step is to perfect the actual mechanics of office practice so that I can handle efficiently the number of treatment cases necessary to produce the desired net income.

Earlier in my paper I implied that the cost of orthodontic care might be minimized by a standardization of treatment methods, consistent with bi-

ologic principles. I now wish to discuss and analyze my attempts to standardize treatment methods in my practice. Essentially this discussion revolves largely around the construction and use of orthodontic appliances.

During the first years of my practice, I tried many types of appliances. Naturally, some methods appealed to me more than others, and the results obtained showed wide variation. These factors led to a natural selection of procedure based upon personal experiences. My early appliances were predominantly labiolingual, with the minimum number of teeth banded. Later, I banded many more teeth and used more full labial appliances, such as McCoy open tubes, Johnson twin wire, and a few Angle edgewise. Each appliance seemed to have special advantages and I often thought of the desirability of integrating some of these appliances into a common form. The new appliance might include what I considered the desirable features of each of the older appliances and possibly possess some entirely new feautres of its own. Dr. Carl R. Anderson, of Grand Rapids, Michigan, and I often discussed orthodontics together, and gradually this hypothetical appliance came to be our pet subject.

We wanted an appliance that would rotate anterior teeth as easily as the Johnson twin. We wanted the stability of appliance and control of premolars present in the McCoy open tube and the Angle edgewise. We liked the sliding buccal tube sections of the Johnson twin, so useful in retruding spaced and protruding upper anteriors. We wanted accurate machined attachments capable of accommodating a range of arch wires from the Johnson twin to the closely fitted rectangular wire. We wanted an attachment that could be adapted easily to the varying widths of teeth. Having used various materials and recognizing the physical and chemical stability of chrome alloys in the mouth, we wanted an attachment which could be neatly and strongly spot-welded to bands. We wanted an attachment that could be easily cleansed by the patient and would be comfortable to the lips, cheeks, and tongue. We preferred to use ligature to engage the arch wire so that in severely malposed teeth it would be possible to bring the attachment into full engagement with the arch wire by gradual progressive stages. We were also interested in cost.

We hoped for a design so simple that it could be easily and accurately constructed at such a small cost that one could use any amount of bands and attachments without the slightest thought of the cost involved. We wanted to have a large stock of all lengths of attachments welded to bands in a wide range of tooth sizes. And last but not least, we wanted uniformity of mechanical construction. Every attachment should perfectly duplicate the groove dimensions of its mates so that we would have absolute uniformity and dependability. We recognized that every use of the attachment would not require such mechanical perfection, but at this stage we were still thinking in terms of an integrated hypothetical design. We doubted that we would find such an attachment but attempted the search anyway.

None of the commercially made attachments seemed to satisfy our desires, so we attempted to construct some of our own design. I was fortunate enough to have home workshop machine tools, including a screw-cutting metal-

turning lathe with milling attachment. A survey of available stock materials in our offices resulted in the use of ½ round shaft material of various sizes. Naturally many of our attempts were of no value, but we finally hit upon one which began to show some promise. It possessed most of the advantages of the Johnson twin attachment, some of those of the McCoy open tube, and used a ligature to engage the arch wire. It had the advantage that it could be easily spot-welded to a band, producing a very neat strong attachment, and it was adaptable to all widths of teeth. Our method of machining was far from perfect, and uniformity and accuracy were lacking. It worked very nicely with the Johnson twin wire, however, and for this purpose it could be made with an ordinary carborundum disk. We told some of our friends about our findings and they too constructed a number and tried them on their cases.

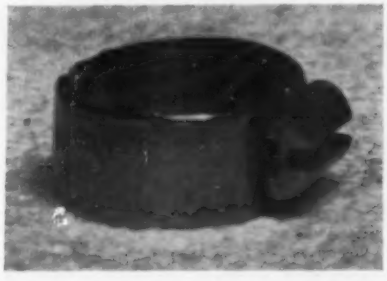


Fig. 1*A*.—Enlarged photograph of typical anterior stock band and No. 4 attachment.

Fig. 1*B*.—Variations of Fig. 1*A* for use on central incisors, lateral incisors, cuspids, and premolars.

Dr. Anderson and I were requested to present this attachment and the method of construction as a table clinic at the New York meeting of the American Association of Orthodontists in 1941. Since that time we have made minor changes in the design and size of the attachment, but most of the improvement has been in the method and accuracy of machining. The present attachment is by no means the answer to all that can be desired in an orthodontic attachment, but from our standpoint it does possess most of the features of our original hypothetical design. It has served our purposes very well. For want of a better term, when referring to it in our treatment records we call it No. 4 attachment, because it is the fourth modification that has received practical use in the mouth. Figs. 1*A* and 1*B* show an enlarged photograph of an attachment on a band, together with modifications for use on incisors, cuspids, and premolars. The top groove is machined to carry accurately 0.022 by 0.028 inch rectangular wire, but in our practices we seldom go beyond 0.022 inch round wire except for partial arches and buccal sections.

We carry a large stock of bands with attachments welded in the middle third. Accurate positioning is obtained by use of a jig so that the groove lies exactly at right angles to the axis of the cylinder of the stock band. We use 0.004 inch band material. Anterior bands are 0.125 inch wide and premolars 0.180 inch wide.

Anterior bands are graded from 13 mm. to 28 mm. net circumference, and premolars from 21 mm. to 29 mm. Anterior bands are not festooned, but premolars are modified considerably. Fig. 2 shows a stock premolar band, before being adapted to a tooth.

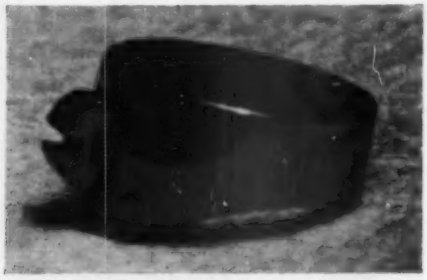


Fig. 2.—Enlarged photograph of typical premolar stock band and No. 4 attachment. The same festooning is used for both upper and lower bands.

Fig. 3.—Enlarged photograph of lower left molar band and rectangular tube showing recess at distal end of tube to accommodate molar ligature.

Molar attachments are made from the same stock as anteriors but have only one groove, namely, the 0.022 by 0.030 inch rectangular tube. On the band side of the posterior end of the molar attachment a small vertical groove is cut to accommodate the molar ligature. Fig. 3 shows an enlarged photograph of molar band and attachment. The attachments are welded to molar bands in four different manners for each tooth size so as to fit either upper or lower right or left molars. Upper molars are formed with the taper and welded joint on the lingual and lower molars with taper and welded joint on the buccal. Rights and lefts are separated because of the little recess at the distal of each molar attachment for accommodation of the molar ligature.

The bands are constructed of 0.007 by 0.17 inch chrome alloy band material with tapered welded joint and are festooned mesially and distally. All of this work can be done very easily by a laboratory assistant.

Band construction is efficient and rapid and a high degree of accuracy in fitting the band is easily obtained. My method of band construction is as follows.

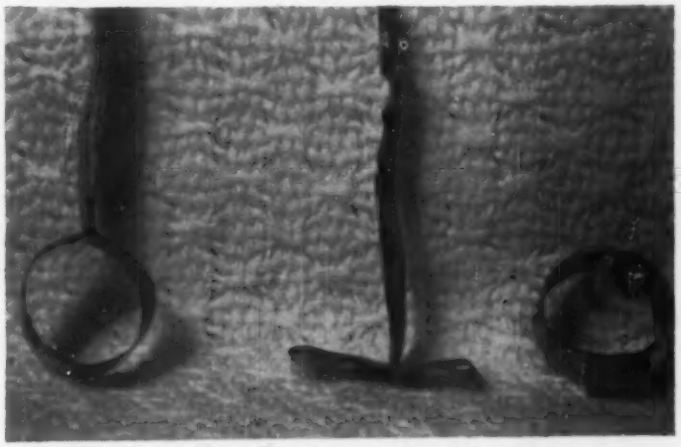


Fig. 4*A*.—Selection of band size by use of copper measuring strip.

Fig. 4*B*.—Adaptation of stock band.

*Anterior Bands. Central and Lateral Incisors.*—Measurement is taken with copper strip. The loop is then flattened and measured. This measurement approximates ½ the circumference. Double this measurement and add 1 mm. to obtain the band size. Select the band and seat it on the tooth. It will fit accurately on cervical edge of band at the place on the tooth where the measurement was taken. Using long pointed beaked pliers like S. S. White No. 146, take up incisal surplus by forming a loop on the lingual. Pinch this together with round nosed plier, such as S. S. White No. 110, and tip the pinch to one side. Remove band, flatten pinch, and spot-weld. Figs. 4*A* and 4*B* illustrate this method of band adaptation. Return the band to the tooth and it will usually be found to fit very accurately. Sometimes if only a small amount of slack appears on the incisal edge of band, instead of using the above-described pinch joint, I make a small vertical cut on the lingual, lap the joint, and spot-weld. In rather straight-sided teeth, I often find after adaptation that no pinch or loop is required. The band is now ready for cementation.

*Cuspids.*—The procedure is the same as for central and lateral incisors except that more tapering is required and multiple lap joints are preferable

to one large pinch. I usually find that two, evenly spaced on the lingual, serve very well.

*Premolars.*—The same steps are used as described above for incisors and cuspids, only I use bands prepared and festooned for premolars. A small cut and lap joint about 1 mm. to 1.5 mm. long in the center of the lingual occlusal margin usually results in a well-fitting premolar band.

*Molars.*—The same method of measuring is used. The proper band of the four supplied in each tooth size is selected. The band is fitted and worked into the buccal and lingual grooves, but it is seldom necessary to make any supplementary pinches or joints if the original taper of the preformed bands is correct.

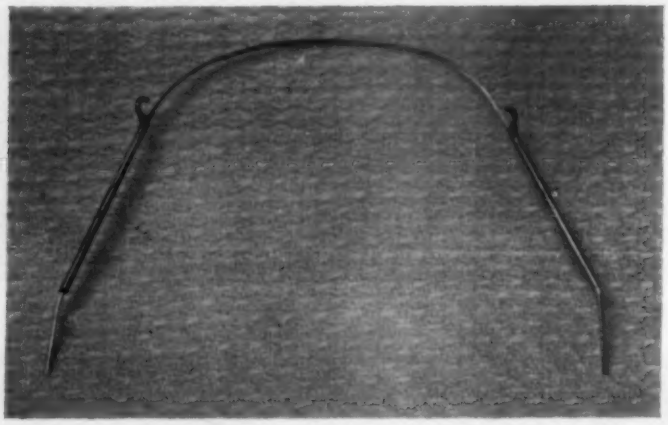


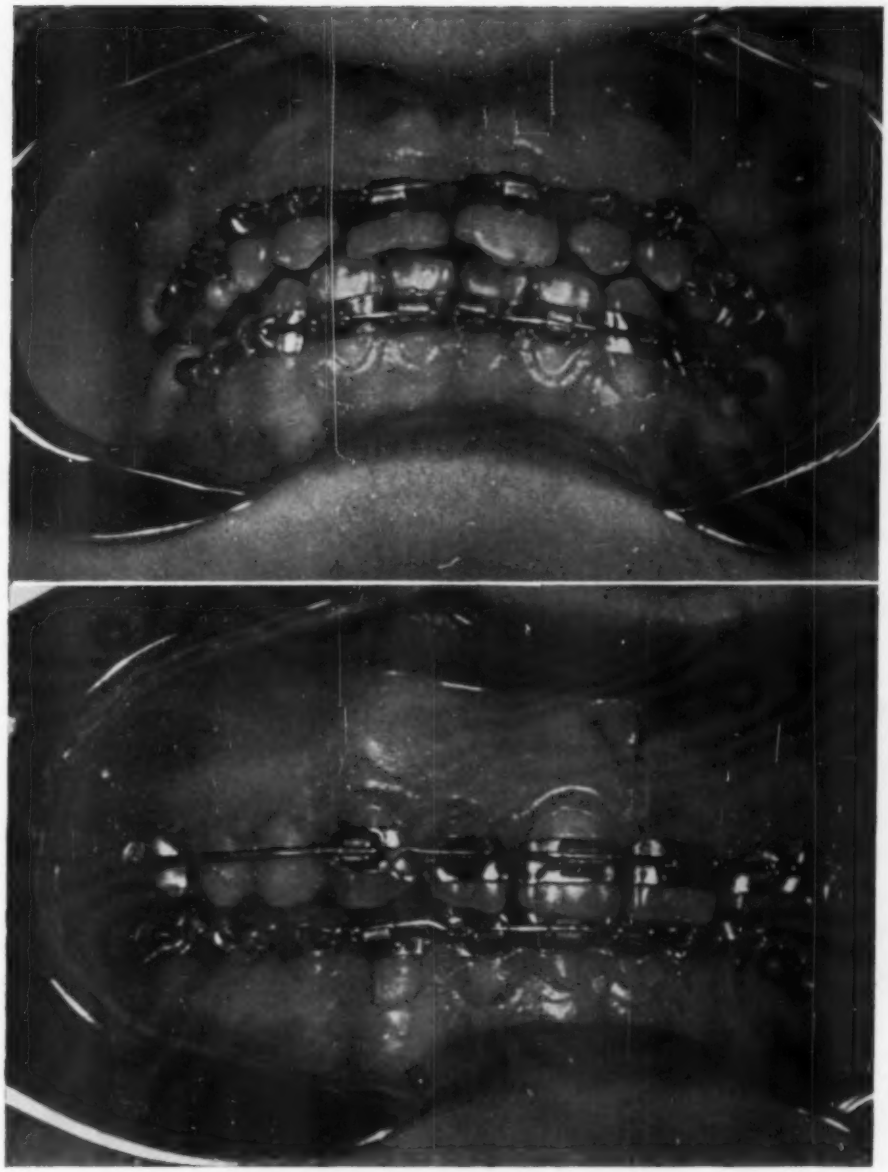
Fig. 5.—Modified Johnson arch.

I feel that use of the above-mentioned technique of band construction has decreased my operating time to only a fraction of its former amount. Mechanical variations in treatment consist largely of a difference in the number of bands used and in the type of labial arch selected. The types of labial arches range from simple 0.015, 0.018, 0.020, and 0.022 inch round arches to modified Johnson twin arches and some rectangular arches. Fig. 5 shows the modified Johnson arch. It consists of either a single wire or the typical twin-wire anterior section fitted into buccal tube sections. The buccal tubes stop short of the molar band attachments, and a section of 0.022 inch round wire is inserted into the distal end of the buccal tube section. This 0.022 inch round wire fits into the 0.022 by 0.028 inch buccal tube on the molar band. The advantages of this design are twofold. First, it allows the operator to start with a Johnson twin-wire arch; and later, after retruding the anterior teeth, he can band the premolars and change directly to a full labial arch. Second, it gives more resiliency to the distal end of the arch without sacrificing stability, and thus rotation and distal tipping of molars can be controlled more easily.

Some lingual arches are used in conjunction with labial arches, but I find that I am not using them as much as in the past.

My laboratory time has been cut to the minimum because my laboratory assistant is now able to take care of practically everything except the operations I perform at the chair. I have control because I can depend on accu-

*A.*



*B.*

Fig. 6.—*A*, Full appliance treating bimaxillary protrusion with severe open-bite. *B*, Modified Johnson arch in conjunction with full lower appliance, treating Class II, Division 1 case.

racy and uniformity. I feel that I am getting closer to my goal of standardization consistent with biologic principles. Fig. 6 shows photographs of some typical appliances.

There are a few accessories to the above basic appliance which might be of interest. Even with the greater width of attachments, sometimes an

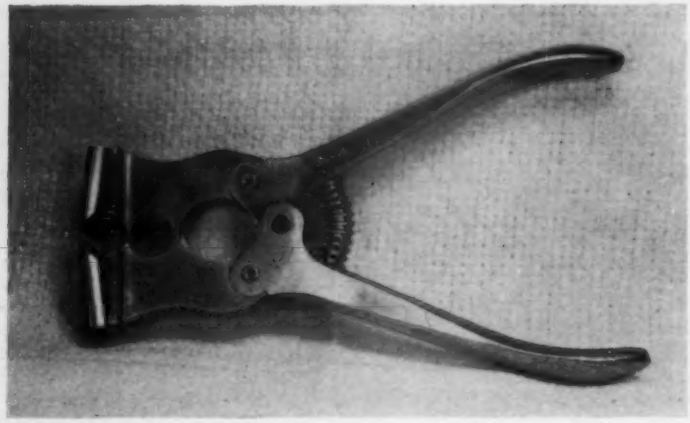


Fig. 7*A*.—Double-action Starrett wire-cutting plier No. 1—5½ inch, used in making eyelet loop-forming plier.

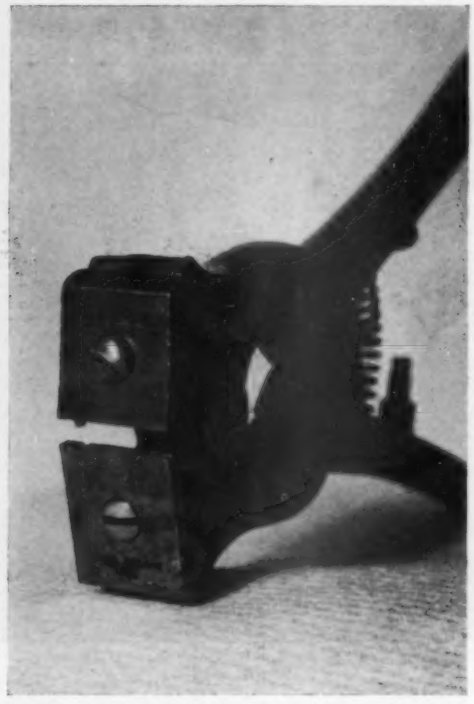


Fig. 7*B*.—Modification of jaws of Starrett plier to form eyelet loop-forming plier.

eyelet is useful. These are easily and quickly made and spot-welded to the band in any desired position. Figs. 7*A* and 7*B* show the modified plier used for this procedure. It is made from a double-action wire-cutting plier No. 1—5½ inch.* The cutters are ground as shown in the photograph making a die in

*Made by the L. S. Starrett Company.

which 0.015 or 0.018 can be quickly formed. The wire is then bent at right angles to facilitate easier positioning on the band and erect position of the loop. Spot-weld the wire on each side of the loop with a grooved electrode. Clip off the wire, disk the ends, and a small strong eyelet is formed. Figs. 8*A* and 8*B* illustrate the formation of the eyelet and the technique for welding it onto the band.

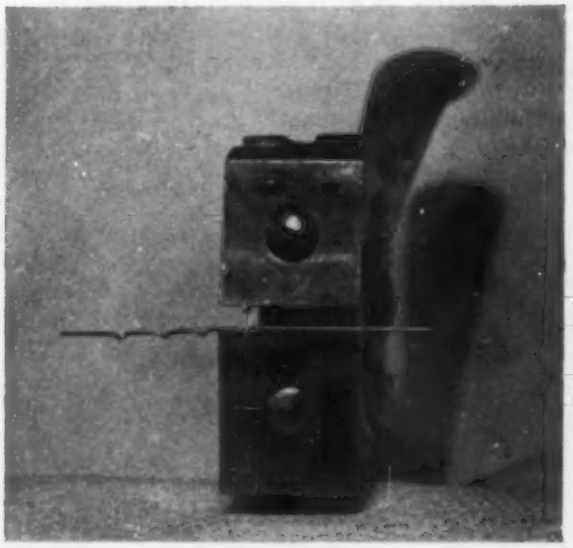


Fig. 8*A*.—Formation of eyelets using 0.015 inch round wire. In practice only one loop is formed at a time and used as in Fig. 8B.

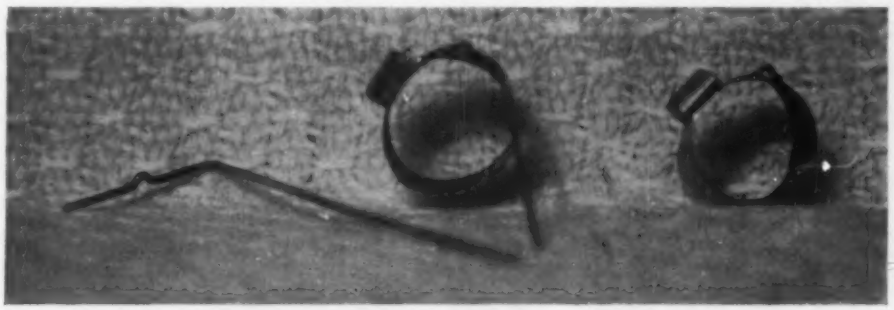


Fig. 8*B*.—Illustrates welding of eyelet to band as explained in text.

The method of grinding electrodes to spot the attachments on the bands is also important. The lower electrode should be disked to an even roundness in all directions. The upper electrode is filed to a deep V with sides accurately contacting the two upper curved surfaces of the attachment but not touching the upper machined groove. A small bit of petroleum jelly is placed on the band. The attachment is placed on the petroleum jelly, which then holds the attachment in place while the assembly is being oriented between the electrodes. Spot the attachment once on low current. Now check the position of attachment and test its alignment with a piece of rectangular wire at least 6 inches long. The one small spot weld will allow for minor adjustments. Return the band to the spot welder, and thoroughly weld the attachment to the

band by numerous high-power spots along the entire attachment. Properly ground electrodes will not burn the metal. Fig. 9*A* shows properly ground electrodes assembled in a spot welder, and Fig. 9*B* shows a band and attachment in position ready to weld.

The method of cutting the grooves in the attachments may also be of interest. High-speed slitting saws of proper widths (0.023 for upper groove, and 0.036 for under groove) are placed in an arbor in the lathe. A jig or carrier for the wire is constructed with grooves to carry the wire accurately

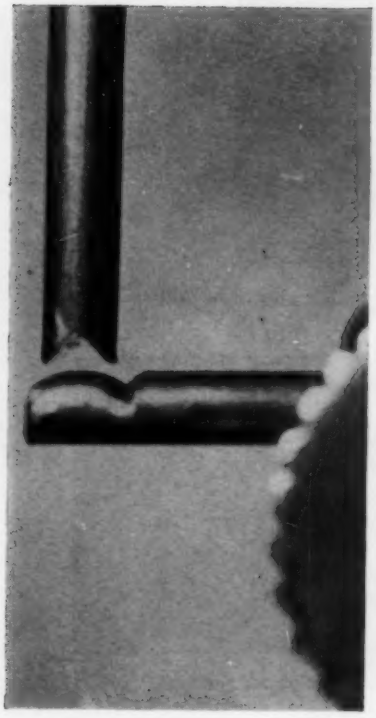


Fig. 9*A*.

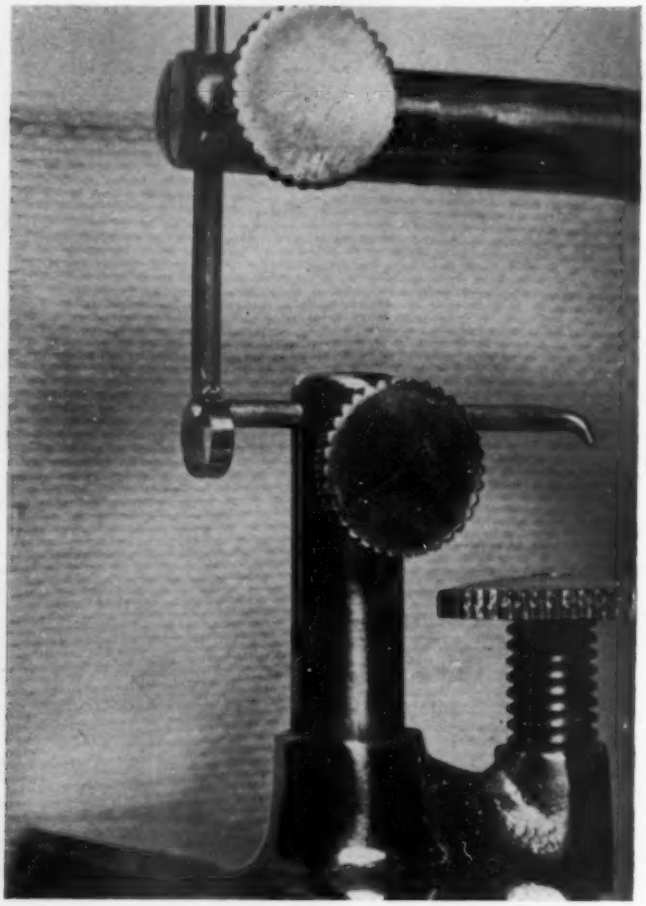


Fig. 9*B*.

Fig. 9*A*.—Enlarged photograph of properly ground electrodes.
Fig. 9*B*.—Band and attachment assembled in spot welder.

and is held by a milling attachment. The saw is set for proper depth of cut and the wire is fed into cutter by mechanical feed. When cut is completed, the jig is loosened, the wire moved forward the amount of the feed thrust, and after the wire is fastened in the jig the next cut is made. After one side is completed, reverse the wire, change to a saw of proper thickness and proceed with cutting the second groove. The wire is then removed and attachments of proper length cut from stock wire. Fig. 10 shows a photograph of the lathe set up with the wire in position to start a cut.

The purpose of this paper has been to visualize some of the problems of postwar orthodontics, and to devise methods of handling them. From the evidence presented I have concluded that the amount of money the average family will have available to spend on orthodontics in the postwar period may be appreciably reduced. In order to utilize the money available to the best advantage, I have suggested that the approach to orthodontic treatment

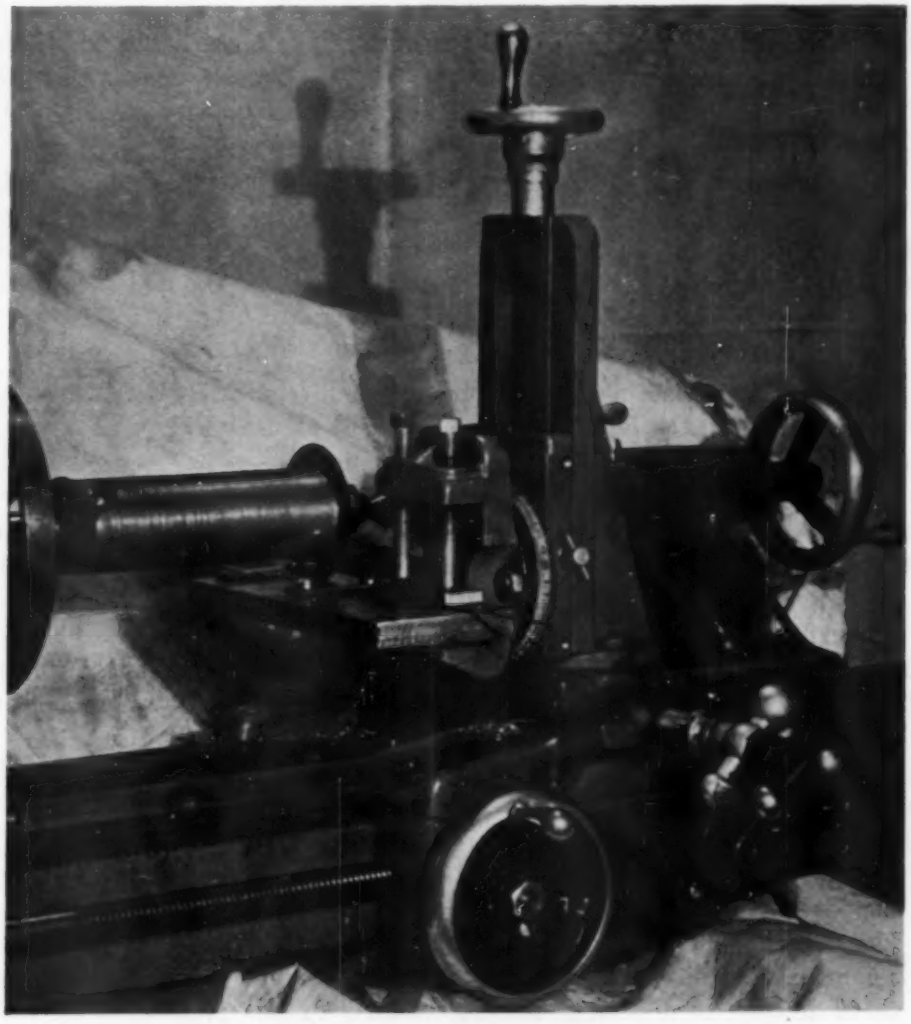


Fig. 10.—Lathe set up, with wire in position ready to start a cut.

be considered primarily on the basis of health needs. I have gone on to develop the point that the basic health needs of the patient must be considered first and then as much be added to this for the general well-being of the patient as circumstances permit. I have stated that the actual operating cost of orthodontic treatment may be minimized by a standardization of operative technique consistent with good treatment principles, and I have presented the methods I am using in my practice to develop such a standardization.

In appreciation of his cooperation in the development of "No. 4 attachment," I want to acknowledge the work of Dr. Carl R. Anderson of Grand Rapids, Michigan.

# A PHILOSOPHY OF ORTHODONTIC TREATMENT

CHARLES H. TWEED, D.D.S., TUCSON, ARIZ.

BEFORE reading my paper it will be necessary to make a few preliminary remarks pertaining to the sectional models that appear in many of the illustrations. This, I am sure, will make it possible for you to correctly interpret all the illustrations.

The bases of all these models are cut parallel to the occlusal plane. Whenever the profile of the patient appears with the sectional models, note the positions and inclinations of the mandibular incisors with relation to dental base and correlate the positions of these teeth with facial esthetics. Also note the thickness of the alveolar process.

Fig. 1 illustrates four sectional models.

*A*, the top figure is a model of a nonorthodontic normal. Note the angular inclinations of the mandibular incisors as related to dental base; also note the thinness of the alveolar process and compare with *B*.

*B* is a sectional cast of a finished orthodontic case. Note the angular inclination of the mandibular incisors. The alveolar process is quite thin due to the fact that these teeth have been tipped off the dental base, not displaced bodily; compare with *A*.

*C* is a finished orthodontic case in which the teeth have been maintained in an upright position but have been bodily displaced mesially. Note the thickness of the alveolar process and compare with *A* to determine the extent of the bodily displacement.

*D* shows the retreatment of *B* after the removal of all four first premolars. Compare *D* with *A*, which is the nonorthodontic normal. Note the similarity of the inclinations of the mandibular incisors with relation to dental base in *A* and *D*. Note, also, the thinness of the alveolar process in this treated case, *D*, and compare with the nonorthodontic normal in *A*. Now compare with *C*.

The development of the philosophy of orthodontic treatment presented in this paper has required approximately twelve years. During an additional five years devoted to demonstrating the validity of this philosophy by factual evidence, the author and his several co-workers have come to the conclusion that the principles and methods followed constitute a scientific theory of treatment.

It is my conviction that in the successful treatment of all Class I, Class II, and bimaxillary protrusion types of malocclusion, the mandibular incisor teeth must be positioned on basal bone to be in functional mechanical balance, and that this position is the normal one for these teeth and the most accurate guide available to the orthodontist in the scientific treatment of malocclusions. This precept is based on what I consider to be the correct interpretation of the late Dr. Edward H. Angle's definition of "the line of occlusion."

Read before the New York Society of Orthodontists, New York, N. Y., March 6, 1944, and before the Southwestern Society of Orthodontists, Shreveport, La., Feb. 28, 1944.

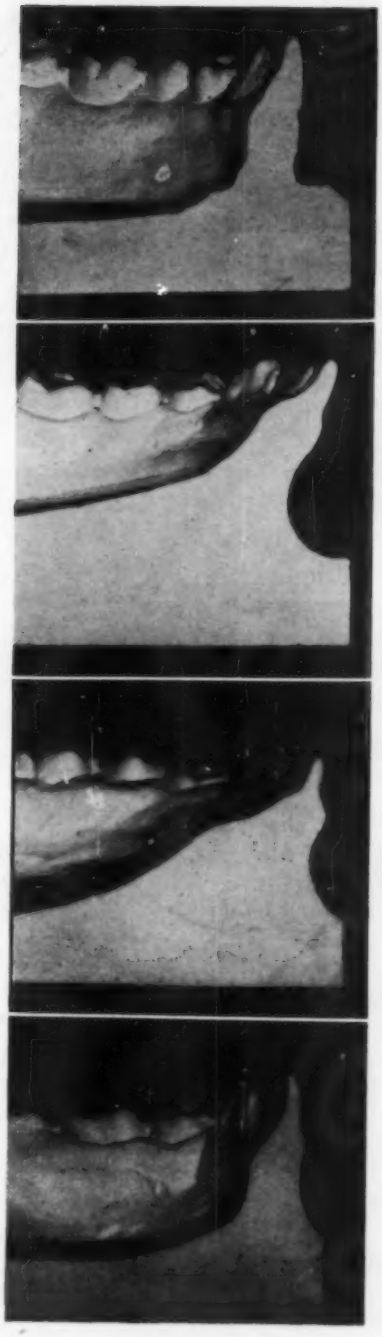



Fig. 1.

A study of this definition leads me to the conclusion that there are six fundamental requirements which must be met if normal occlusion is to be the end result of orthodontic treatment. They are:

1. There must be a full complement of teeth, and each tooth must be made to occupy its normal position.
2. There must be normal cusp and occlusal relationships.
3. There must be normal axial inclinations of all the teeth.
4. There must be normal relationships of teeth to their respective jawbones.
5. There must be a normal relationship of the jaw bones.
6. Normal function of all the associated parts must be established.

For me, a superficial and erroneous interpretation of Dr. Angle's definition of the line of occlusion meant six and one-half unhappy years in the practice of orthodontics, with a record of more failures than successes.

In general, orthodontists are agreed that Dr. Angle was correct when he insisted that the line of occlusion is synonymous with harmony, balance, symmetry, beauty, art, and permanence of normal tooth position, and that in a permanently successful treatment it is impossible to attain one of these qualities without attaining all the others. I have always believed it to be true and I still do so believe. But it is now quite evident that in the beginning of my career as an orthodontist, this definition of the line of occlusion was to me a misty and vague phrase, the meaning of which one must learn to sense. In other words, I had no concept of the normal other than of correct occlusal relationships and ideal arch form. Too often, however, when only these two qualities were attained, something was lost in the balance, harmony, and beauty of the face, and in the permanence of tooth positions.

The most logical starting point from which to begin the search for the causes of my difficulties in the treatment of malocclusions seemed to be a thorough, unbiased analysis of my practice. Accordingly, I divided my cases into two groups. Group I was composed of all those patients—or, more accurately, those few patients—for whom orthodontic treatment had been successful. Group II comprised all the failures.

In a surprisingly short time it became evident that the patients in Group I were much better-looking than those in Group II. Group I (Fig. 2) showed balance, harmony, and beauty of the face in accordance with type; Group II (Fig. 3) did not.

Careful examination of the mouths and faces of the children in Group I revealed that all six of the fundamental requirements for normal occlusion were fulfilled. Here before me were the living demonstrations of the line of occlusion, not the immaterial, intangible something that had to be sensed. Balance and beauty of facial outline, mandibles that were firm and usually prominent, and mandibular incisor teeth that were upright and on basal bone characterized this group of children (Fig. 4).

As a result of this experience I developed a concept of the normal, an indelible image of a face, the features of which encompassed a composite of all six of the fundamental qualities found in the mouths and faces of all the children in Group I (Fig. 5). A concept of the normal is an indispensable part of the orthodontist's equipment. Without it he does not know where or when to

Fig. 2.—Group I. Correctly treated case.

Fig. 3.—Group II. Incorrectly treated case. Note the fullness of the lips, which indicate an abnormal relation of the teeth to basal bone.

begin or end his treatment, but proceeds blindly, hoping that favorable growth factors and inanimate metals will come to his rescue.

Examination of the mouths and faces of the children in Group II showed that all fulfilled the first two requirements for normal occlusion; viz., all had a full complement of teeth, and the objective of good cusp and occlusal relationship had been attained for all prior to relapse. The last four requirements, however, were not fulfilled in this group of children. Concerning the third requirement, it was observed that the mesial axial inclinations were too great in most instances.

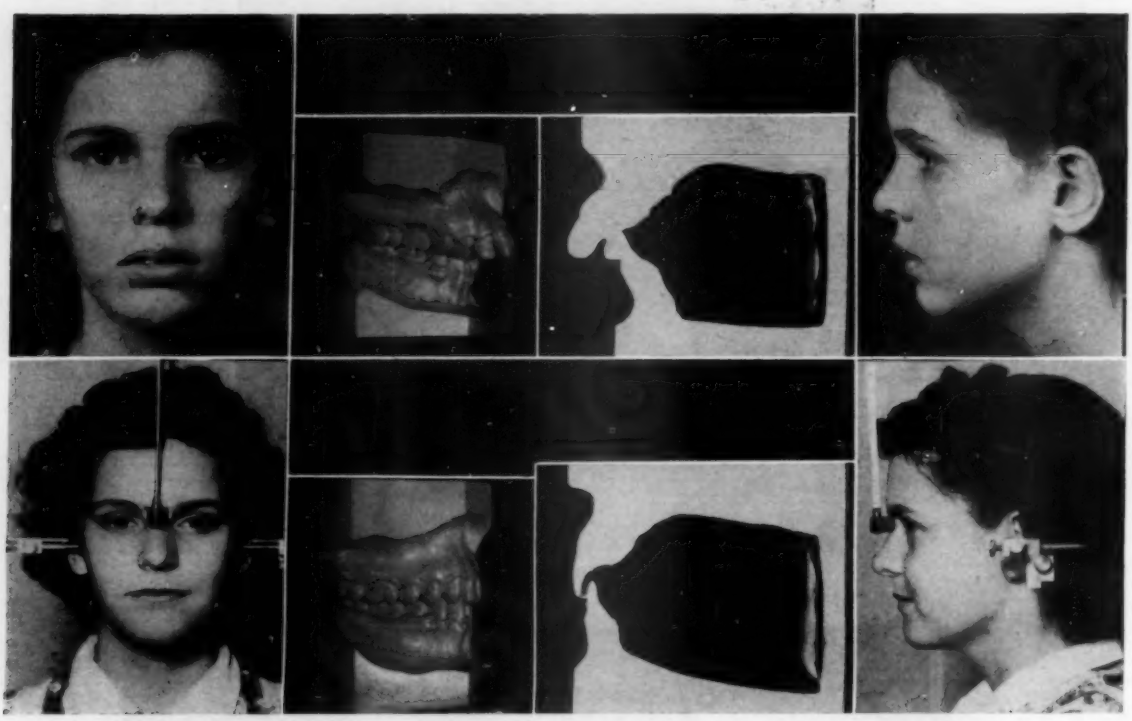


Fig. 4.—Group I. Correctly treated case in which all six of the fundamental requirements for normal occlusion were fulfilled. Note the inclinations of the mandibular incisors with relation to base, and correlate with the fine balance noted in the facial esthetics seen in the lower figure.

With respect to the fourth requirement, that of normal relationships of the teeth to their respective jawbones, failure was pronounced. In an overwhelming proportion of the group, the mandibular incisor teeth were found to be too far forward in relation to mandibular basal bone. This defect varied from a slight mesial crown tipping (Fig. 6) to severe displacement (Fig. 7), and the havoc wrought in facial esthetics was in direct ratio to the extent of the mesial tipping or displacement of the mandibular incisors. Incidentally, facial esthetics usually improved somewhat, as relapse occurred in response to Nature's efforts to position the mandibular incisors back on the basal bone in functional balance.

As for the fifth requirement, that the jawbones should be in normal relation to each other, most of these children presented Class I malocclusions before orthodontic treatment was begun. According to Dr. Angle's views, the jawbones were in normal relation to each other. When treatment had been

terminated, there was no doubt that they had been transferred from Class I malocclusion into the classification of bimaxillary protrusion (Figs. 8 and 9).

Children in this group, whose Class II malocclusion had been treated, presented mandibles that were still underdeveloped, though in most instances the

Fig. 5.—Group I. Correctly treated case demonstrating harmonious facial esthetics as a result of correctly positioning the teeth in relation to their basal bones.

cuspal relation had been successfully changed from a Class II to a Class I relationship. This change was accomplished by displacing the mandibular teeth mesially to a greater extent than the maxillary teeth had been moved distally. Thus, the result of the treatment was the exchange of a Class II malocclusion for one complicated by a bimaxillary protrusion condition (Fig. 10).

Obviously, not one of the children in Group II fulfilled the sixth requirement, that of normal function of all the associated parts.

This analysis of my practice clearly demonstrated to me that, as a rule, failures in treatment were caused by failure to correct all perverted axial inclinations and to establish normal relationships of the teeth to their respective basal bones.

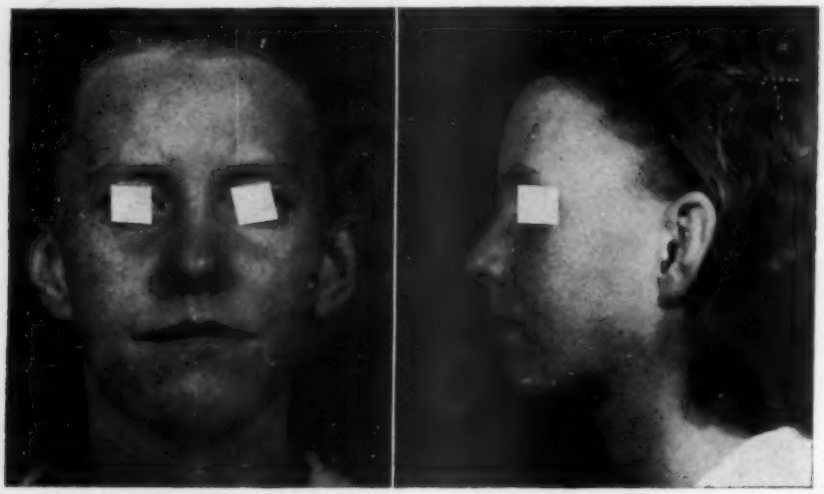


Fig. 6.—Group II. Incorrectly treated case. Note the effect on facial esthetics when the teeth are mesial to their normal positions.

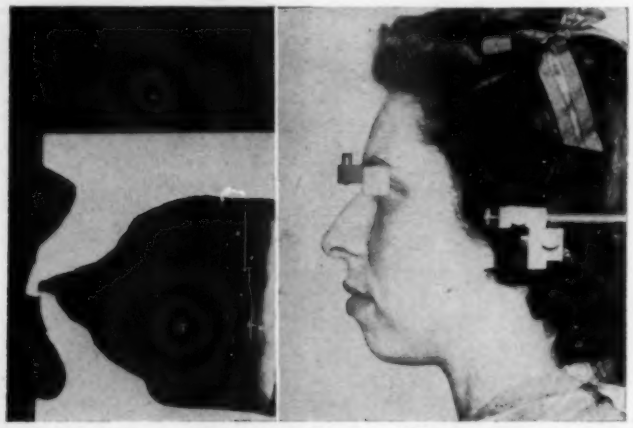


Fig. 7.—Group II. This case was incorrectly treated when the patient was at the age of 13 years. Fourteen years later the stimulation of function had not corrected the protrusive condition, nor had facial esthetics improved.

For years I have been on the lookout for faces that approached my mental concept of the normal. Whenever opportunity offered, I examined the mouths of those whose faces presented such characteristics. With few exceptions, all had either normal occlusion or Class I malocclusions. In all cases the mandibular incisors were on basal bone, even though in Class I cases they were, of course, irregular. It thus became evident to me that there is a definite correlation between balanced facial lines and the position of the mandibular incisors with relation to basal bone.

Fig. 8.—Group II. Note that the mandibular incisors have been tipped and bodily displaced mesially from their normal position with relation to basal bones.

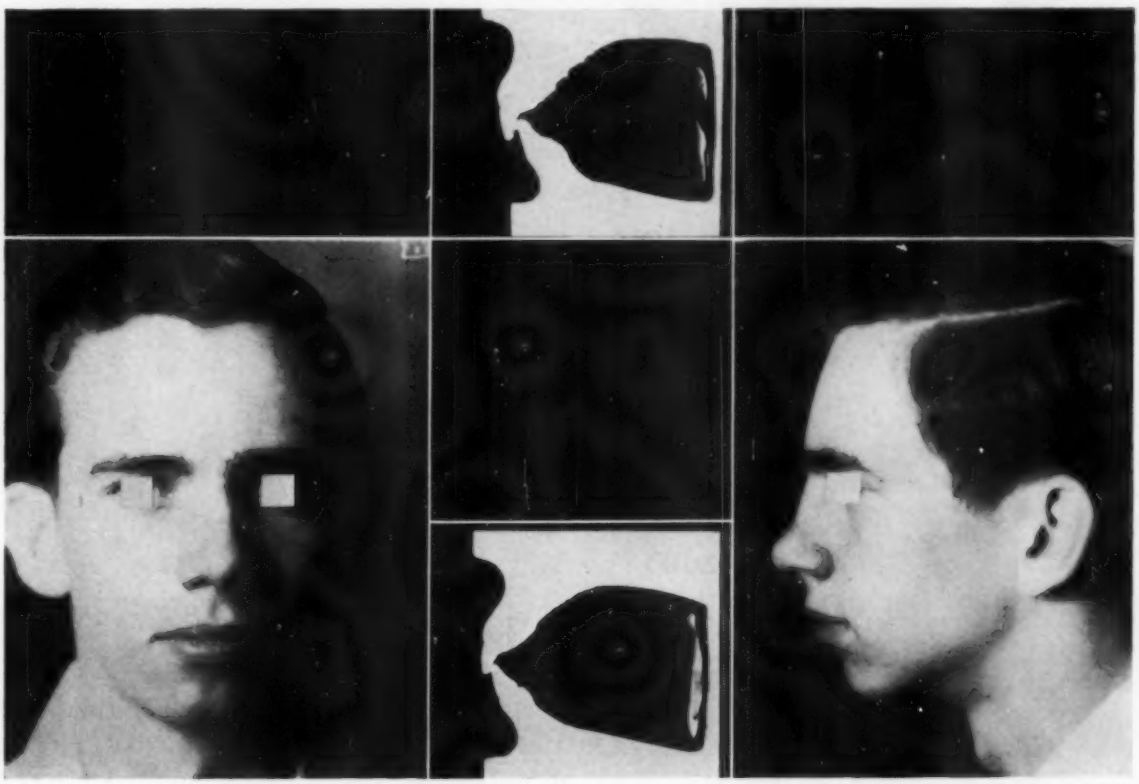


Fig. 9.—Group II. This case was incorrectly treated when the patient was at the age of 13 years. Ten years later the stimulation of function had not corrected the protusive condition nor had facial esthetics been improved.

In order to become more familiar with the normal relation of the mandibular teeth, especially the incisors, to basal bone, I made a study of the mouths of individuals with normal occlusion. The growth and development of both the dentures and faces of these people had apparently followed normal growth patterns, since none of them had required orthodontic aid.

Fig. 10.—Group II. Incorrectly treated Class II case. The stimulation of function for ten years has not corrected the protrusive condition nor have facial esthetics been enhanced.

Accurate profile photographs were taken of my subjects, and plaster models were made of their mouths. These models were then cut through the median line. A study of these cross sections through the body of the mandible and alveolar process at the median line demonstrated that in each instance the mandibular incisors overlay the basal ridge of bone, which is that portion of the body of the mandible on which the alveolar process rests. Further careful observation and study of the relation of the mandibular incisors to their basal bones were made, and these relationships were correlated with the fine balance and harmony of facial esthetics virtually always found in such cases.

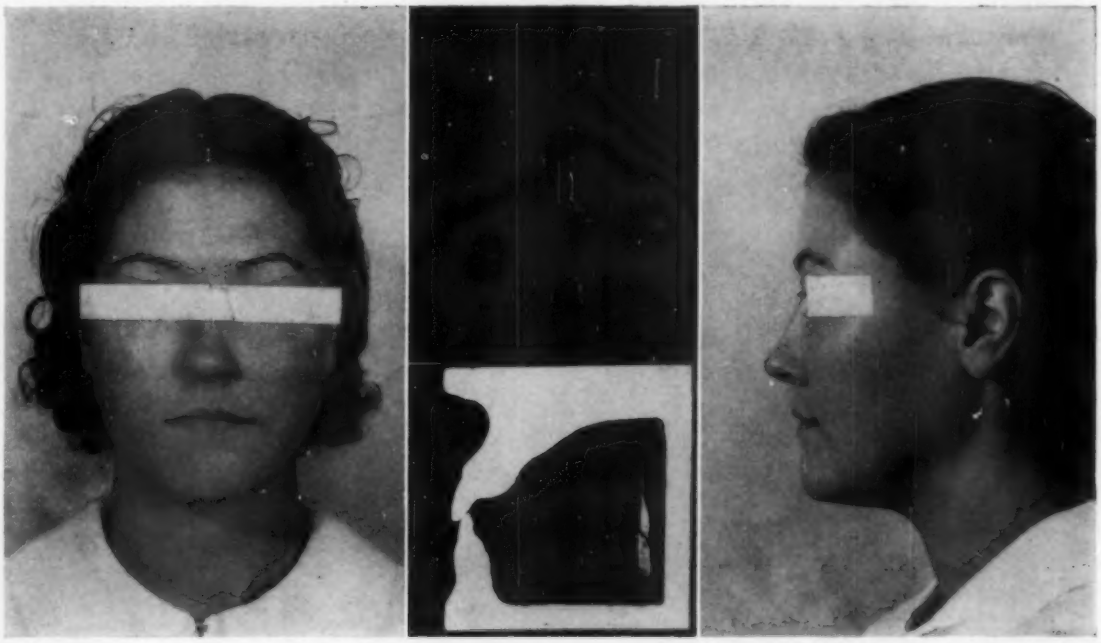


Fig. 11.—A normal occlusion demonstrating minus 5 lingual axial inclination of the mandibular incisors.

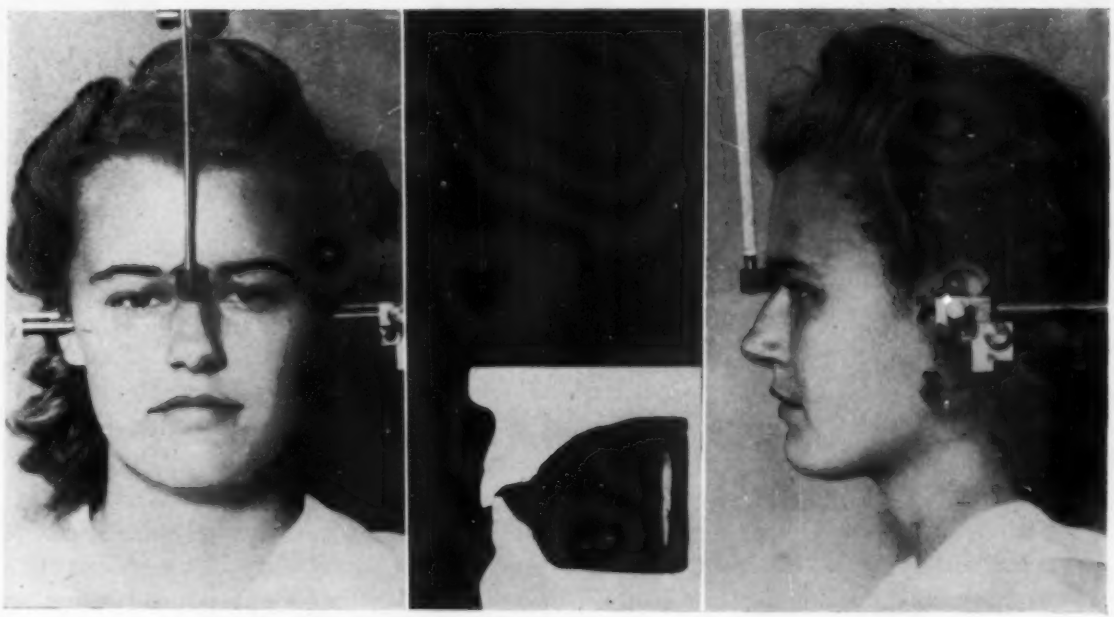


Fig. 12.—A normal occlusion demonstrating plus 5 axial inclination of the mandibular incisors.

These normal cases did, however, present variations in the axial inclinations of the mandibular incisors. For descriptive purposes, the normal that demonstrated the greatest lingual axial inclinations of the mandibular incisors was designated as minus 5 (Fig. 11), the normal having the greatest labial axial inclination of these teeth as plus 5 (Fig. 12), the normal whose axial inclinations were nearly vertical as 0 (Fig. 13). A knowledge of this range of variability of the normal axial inclinations of the mandibular incisors is very important in treatment.

Fig. 13.—A normal occlusion demonstrating 0 axial inclinations of the mandibular incisors.

It is only remotely possible that any orthodontist will ever be able to examine a patient and accurately predetermine where, in this scale of minus 5 to plus 5 (Fig. 14), the mandibular incisors must be positioned in order to be in functional and mechanical balance. Our endeavors in treatment must therefore be to place the mandibular incisors at minus 5 on the scale (Fig. 15), in order to safeguard against relapse.

Most of us agree that there is little likelihood of positioning the denture too far distally in relation to the basal bones, and that if we should err in this direction, function will drive the denture forward so that eventually it will find its functional balance point somewhere within the range of minus 5 to plus 5. Experience has proved that ordinarily it is impossible for function to make such a correction when treatment has left the denture in protrusion. In such cases we have all experienced collapse and failure in the lower incisor region as Nature endeavored to bring the denture back to functional mechanical balance.

The research that my brother, Capt. William Tweed, and I have been carrying on for the past six years—that of completing the records of all our former cases, and of studying series of cases presenting normal occlusion—fully

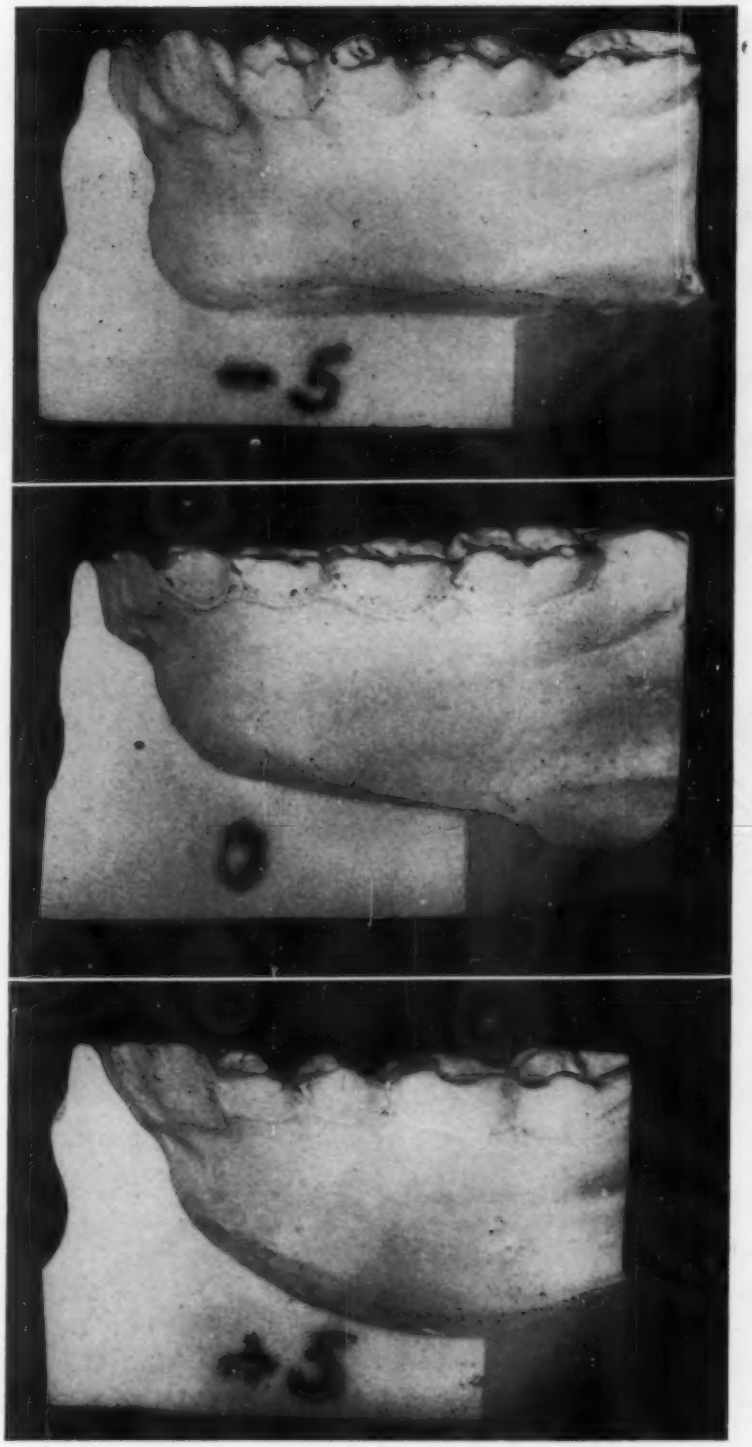



Fig. 14.—Minus 5 to plus 5 range of the normal inclinations of the mandibular incisors.

substantiates the contention that in scientific orthodontic treatment the mandibular incisors must be placed upon the basal bone. The evidence compels us to accept this phenomenon of the relationship of the mandibular incisors to their basal bones as a guide in diagnosis and treatment, and we no longer depend entirely upon the positions of the cusps and upon occlusal relationships.

Fig. 15.—Group I. Correctly treated case demonstrating minus 5 relation of mandibular incisors. Nonextraction case.

The causes of the majority of our failures in treatment are now readily understood. Formerly, along with most other orthodontists, I accepted the positions of the mandibular teeth as a guide in occluding the maxillary teeth, regardless of the relation of the mandibular teeth to their bony bases; though this relation is in most cases, and especially in Class I, Class II, and bimaxillary protrusion types of malocclusion, as far from normal as the corresponding relation in the maxillary teeth. (Fig. 1.)

It is all too evident that we have refused to recognize the fact that mandibular teeth may have tipped or drifted mesially if there has been a break in the continuity of the mandibular arch, or if the restraining influence of the orbicu-

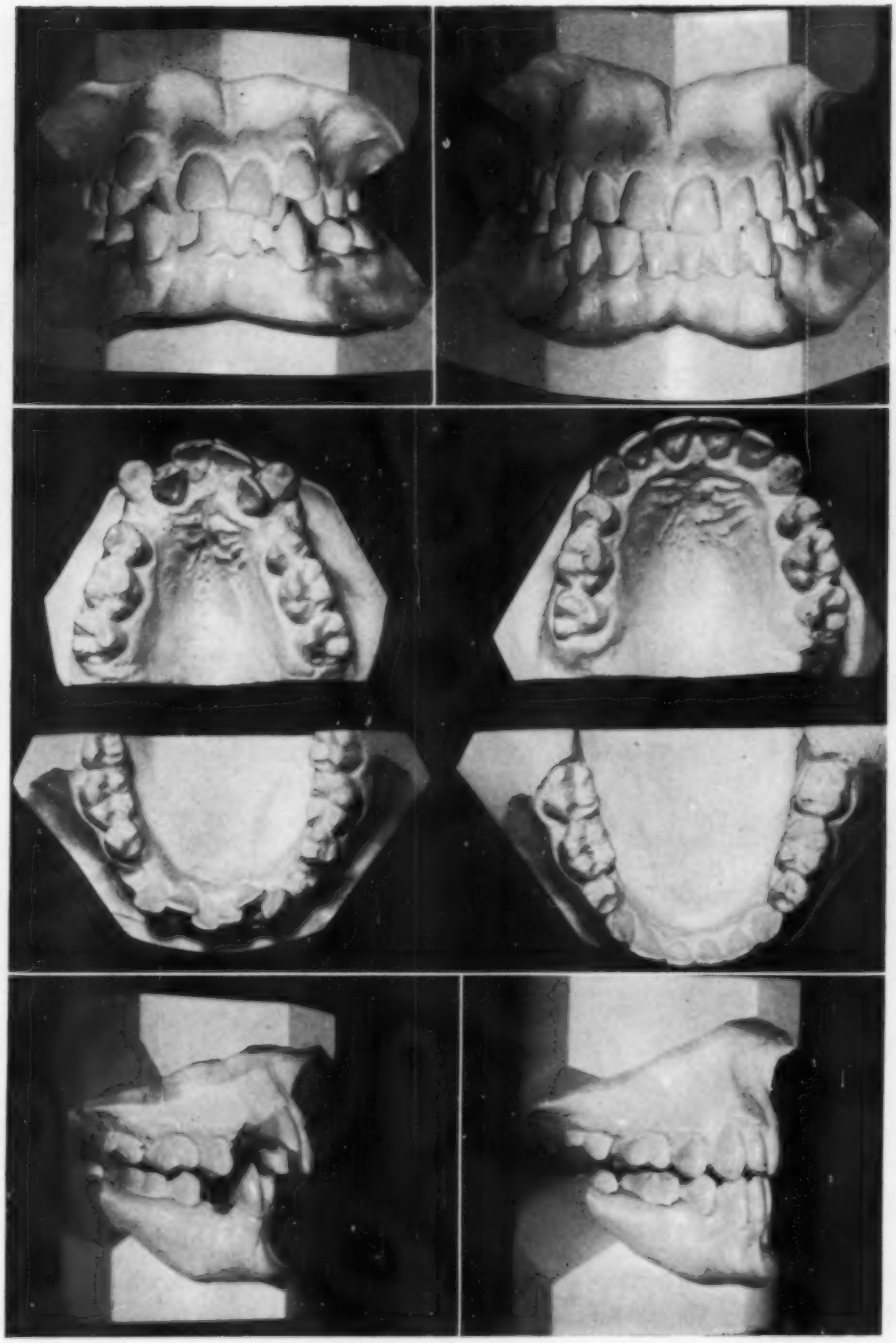


Fig. 16.—Group I. Before and after models of a correctly treated case.

laris oris is deficient. Also, if there is a lack of normal osseous development of basal bones, there is insufficient space to accommodate the teeth in their correct positions.

Fig. 17.—Group I. Before and after photographs of the patients whose models appear in Fig. 16.

In the former case, it is at times possible to position teeth without sacrificing dental units. In the latter case (Figs. 16 and 17), owing to the discrepancy between tooth structure and osseous structure, we must resort to extraction of teeth if the best interest of the patient is served by securing harmonious facial lines and permanency of end result.

In the past we have neglected to take note of this convincing evidence and have concentrated our efforts on correcting irregularities and rotations and gain-

ing arch form. Without thought of first correcting the positions of the mandibular teeth, we have proceeded to use these malpositioned teeth for anchorage units. To facilitate the correction of irregularities and rotations, we have lengthened the arch wire and moved the lower anterior teeth farther mesially, exaggerating the usually already protrusive condition. We have then proceeded to articulate the maxillary teeth to the mandibular teeth. Thus, we have in reality only substituted one malocclusion for another; and, as I have suggested in my discussion of the treatment of children in Group II, the substitution has not always been an even exchange. In fact, I have come to the conclusion that in too many instances our treatment has retarded rather than stimulated growth and developmental processes, and that if favorable growth and development factors had not sometimes come to the rescue of both patient and orthodontist, the percentage of successfully treated cases would have been lower than it was.

Fig. 18.—The headgear.

Let me emphasize again that unless we first establish a normal relation of the mandibular teeth to the mandibular base and keep that relation throughout treatment, our efforts will result only in substituting one malocclusion for another. That is to say, our sole procedure will have been tooth alignment rather than basic treatment.

In order to produce in my patients a near approach to my concept of the normal, it was necessary to revise and add a preliminary step to the Angle technique of treatment of malocclusion with the edgewise arch mechanism. A complete description of this procedure will be found in the January, 1941, issue of the *Angle Orthodontist*. Treatment is divided into three distinct steps.

1. First step:

   A. Anchorage preparation in the mandibular denture.

B. When necessary, the rearranging of axial inclinations in the maxillary arch, particularly in the incisial region of Class II, Division 1 cases, in such a way as to reduce their resistance to distal movements.

2. Second step: En masse movements to correct jaw relationships.

3. Third step: Detailed tooth positioning preparatory to retention.

The first phase of treatment, which has to do with the correct positioning of mandibular teeth to their bony bases, I have chosen to call anchorage preparation. In my opinion, such a procedure should be the first step in the treatment of all malocclusions. It is accomplished with the edgewise arch mechanism in the following manner.

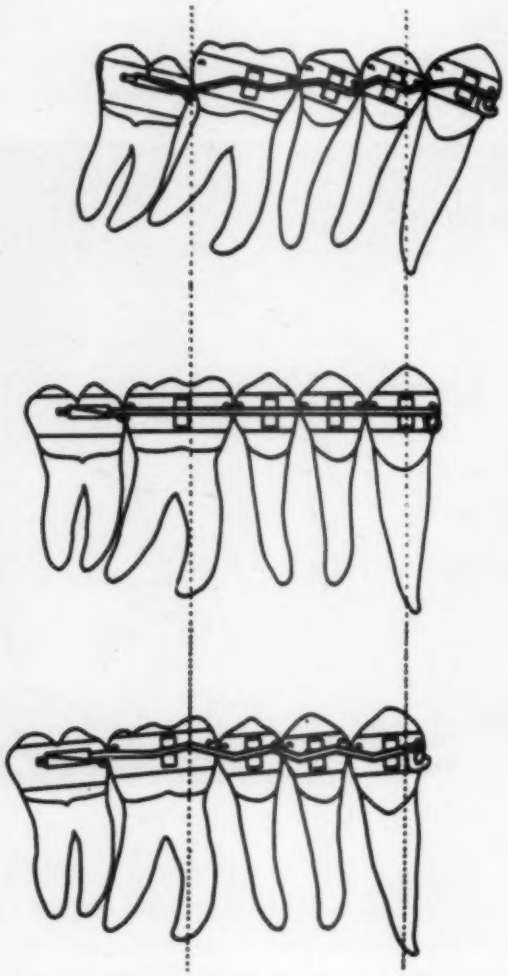


Fig. 19.—Tipping the mandibular teeth distally to prepare stable anchorage.

A headgear is attached to the maxillary denture (Fig. 18). Strong elastic pull, parallel to and coinciding with the occlusal plane, prevents mesial displacement of the maxillary teeth during the time Class III intermaxillary elastics are used. By means of Class III intermaxillary elastic pull and coordinated mechanics placed in the mandibular arch wire, the mandibular teeth are tipped or moved distally until they are normally positioned upon the mandibular basal bone.

To prevent excessive mesial displacement of the maxillary teeth, the distal pull exerted by the headgear on those teeth should be at least twice as great as the mesial displacing force on the maxillary teeth occasioned by the Class III intermaxillary elastics. The mandibular teeth should be tipped or moved distally until the teeth in the buccal segments have pronounced distoaxial inclinations and the mandibular incisors have tipped to the position with relation to basal bone that corresponds to the position of the mandibular incisors found in the minus 5 extreme of the minus 5 to plus 5 range of the normal (Fig. 19). So positioned, the mandibular incisors will have decided lingual axial inclinations.

Fig. 20.—Group I. Correctly treated case in which the extraction of all four first premolars was indicated because of the discrepancy between tooth pattern and basal bone.

With the mandibular teeth so placed, anchorage is prepared, and there is less danger of dislodging these units forward into protrusion when Class II intermaxillary force is used to correct jaw relationships.

Another important factor that should be kept in mind is that when the teeth in the buccal segments are in distolingual axial inclinations and the incisors

in lingual axial inclinations, the forces within the denture during function tend to drive the roots of the teeth forward and outward, thus providing growth stimuli which are conveyed to the basal bones to encourage their forward and lateral growth.

Fig. 21.—Group I. A discrepancy between tooth pattern and basal bone necessitated the removal of all four first premolars. Patient was 32 years of age.

There has never been a question in my mind during the past seven or eight years as to the correct position of the mandibular incisors, but I admit that the greatest difficulties are encountered in so positioning them. But in every instance where there is failure to so position them, something is definitely lost in the balance and harmony of facial esthetics and I fail in my efforts to produce permanence of end results.

Fig. 22.—This case was treated and the full complement of teeth retained with the result seen in the middle figure. Note the poor facial esthetics. The case failed, and two years later all four first premolars were removed and the case retreated. Facial esthetics are greatly improved and the denture is stable.

Fig. 23.—This case was treated in 1929 with the full complement of teeth retained. The middle figure is that of the patient thirteen years later. When the patient was 27 years of age, the case was retreated, after the removal of all four first premolars, with the result noted in the lower figure. Observe that the inclinations of the mandibular incisors are still slightly mesial to normal.

Fig. 24.—The middle figure shows the result of treatment retaining the full complement of teeth. The lower figure demonstrates the change in facial esthetics as a result of retreatment after all four first premolars were removed.

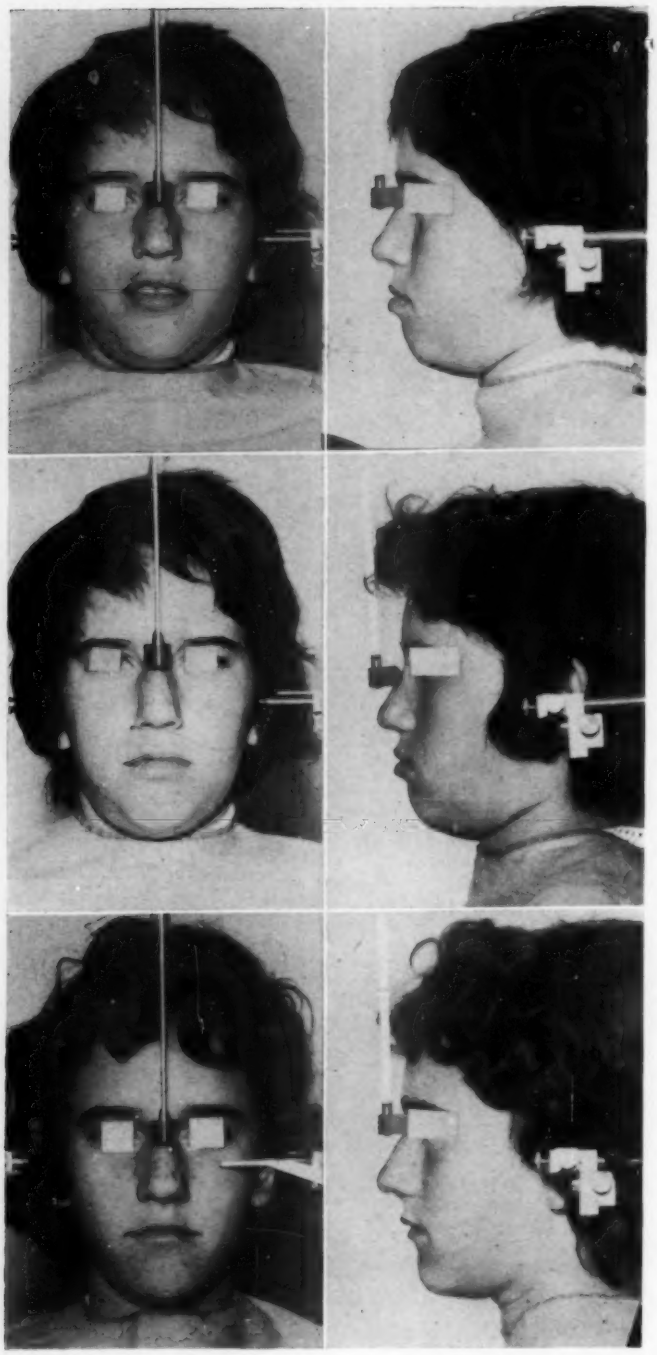


Fig. 25.—This case was treated and the full complement of teeth retained, with the result seen in the middle figure. Facial esthetics demanded that all four first premolars be removed to attain the result noted in the lower figure.

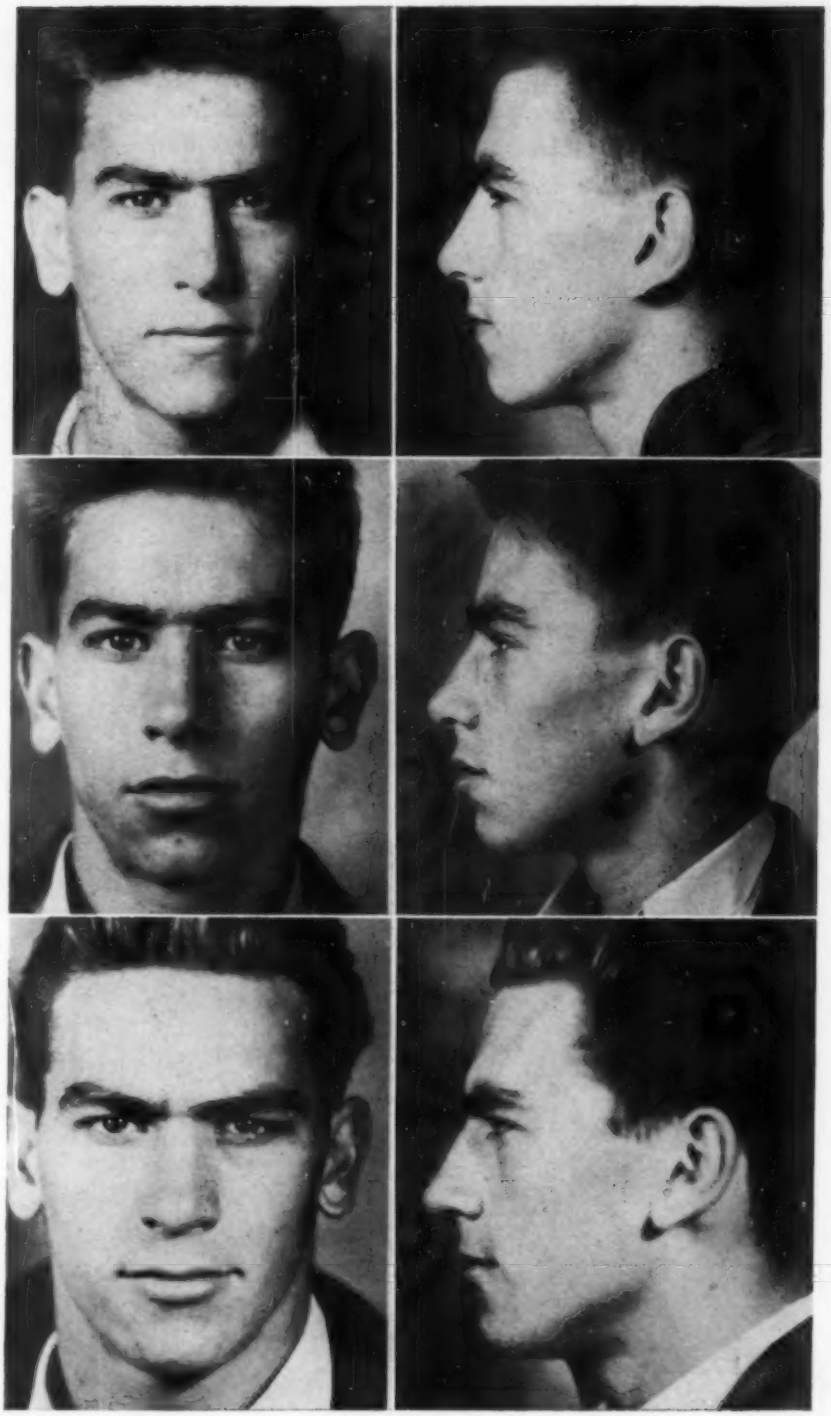


Fig. 26.—This case is most interesting and enlightening. The upper figure is that of a good-looking lad with a Class I malocclusion. The middle figure demonstrates the effects on facial esthetics when a Class I malocclusion is converted into a bimaxillary protrusion by orthodontic treatment. The lower figure demonstrates the recovery when all first premolars were removed and the case retreated.

The headgear and Class III mechanics have been a great aid in preparing stable mandibular anchorage in cases where the previous relation of teeth to basal bone was good. Favorable end results have occasionally been obtained also in the correction of borderline bimaxillary protrusion cases. But I have failed completely in my efforts to satisfactorily correct pronounced bimaxillary protrusion types of malocclusion, even with the use of the headgear and Class III intermaxillary elastic mechanics.

Fig. 27.—Group I. Correctly treated case.

I am convinced that at times there is too much tooth structure and too little basal bone to accommodate all the teeth in their correct relations. I read and published a paper calling attention to this condition and advocating the extraction of all four first premolar teeth in the treatment of bimaxillary pro-

trusion types of malocclusions. The suggestion was not favorably received in 1936. It is interesting to note, however, that since then the excellent research being done by such men as Brodie, Schour, Massler, Broadbent, Sam Lewis, Margolis, Waugh, and others has clearly indicated that more often than otherwise we are confronted with the problem of a discrepancy between tooth anatomy and basal bone, which is due to the failure of growth in the osseous structures. I believe the future will show that this discrepancy occurs more often than is generally believed at present, and that, if the patient's best interest is to be served in orthodontic treatment, we must sacrifice dental units oftener than is believed desirable at present.

Fig. 28.—Group I. Correctly treated case.

Further investigations were made to verify this theory. Similar bimaxillary protrusion cases were treated. In one group the full complement of teeth was retained and the cases were finished with the mandibular incisors either tipped or bodily displaced mesially from their normal positions. Facial esthetics were bad, and the disharmony of facial lines increased in direct ratio to the extent of the mesial displacement of the mandibular incisors from their normal positions. Years of retention were futile, and, as a general rule, collapse of the mandibular arch in the incisal region occurred as Nature endeavored to correct this imbalance by positioning the denture back within the range of mechanical functional balance. (Figs. 6, 7, 8, 9, and 10.)

Irreparable damage to hard and soft investing tissues, particularly in the incisal and first premolar areas, was the usual aftermath of such treatment. Facial esthetics improved as the mandibular incisors in the collapsed mesial segments migrated toward the functional balance point. Almost the only exceptions to relapse were in those patients in whom the protrusive condition was so severe as to eliminate any restraining influence of the orbicularis oris, thus removing the possibility of natural recovery.

In the other group all four first premolar teeth were extracted and the mandibular incisors correctly positioned with relation to basal bone. Facial esthetics were greatly improved, and in some instances a near approach to the normal face, as I envisage it, was attained (Figs. 20 and 21). The average length of the retention period was one year. These dentures are functionally efficient and esthetically pleasing, and the investing tissues are healthy. In addition, they are free from serious relapse.

Fig. 29.—Owing to lack of growth in the body of the mandible, there is not enough room to position all the teeth correctly on basal structure. Four premolars were removed and facial esthetics were benefited. Four premolars were not enough, however, but up to date I have never had the courage to move a cuspid up against a first molar. If that had been done in this case, it most certainly would further improve the patient's facial esthetics.

A third group of patients was treated and their dentures left in a bimaxillary protrusion condition. Facial esthetics were deplorable and the cases relapsed when the wearing of retaining devices was discontinued. These same patients were then retreated after the removal of all four first premolar teeth. The mandibular incisors were positioned on basal bone. The change in facial

esthetics was remarkable, and some of the cases are now out of retention and free from any serious relapse. (Figs. 22, 23, 24, 25, and 26.)

From my investigations I conclude that:

1. The attainment of normal occlusion as a result of orthodontic therapy is limited, much more limited than most of us now realize. (Figs. 2, 4, 5, and 15.)

Fig. 30.—Group I. Correctly treated bimaxillary protrusion case. Observe that all four third molars are in occlusion. My observation has been that when cases in which there exists a discrepancy between tooth pattern and basal bones are treated at the proper time, the third molars erupt into functional occlusion in approximately 80 per cent of the cases. This fact should be food for thought for those orthodontists who pale at the thought of extracting four premolars but think nothing of extracting all four third molars.

2. In normal occlusion the mandibular incisors are always positioned on mandibular basal bone within the range of the normal variation of minus 5 to plus 5. (Figs. 11, 12, 13, and 14.)

3. The ultimate in balance and facial esthetics is achieved only when the mandibular incisors are so positioned. (Figs. 27 and 28.)

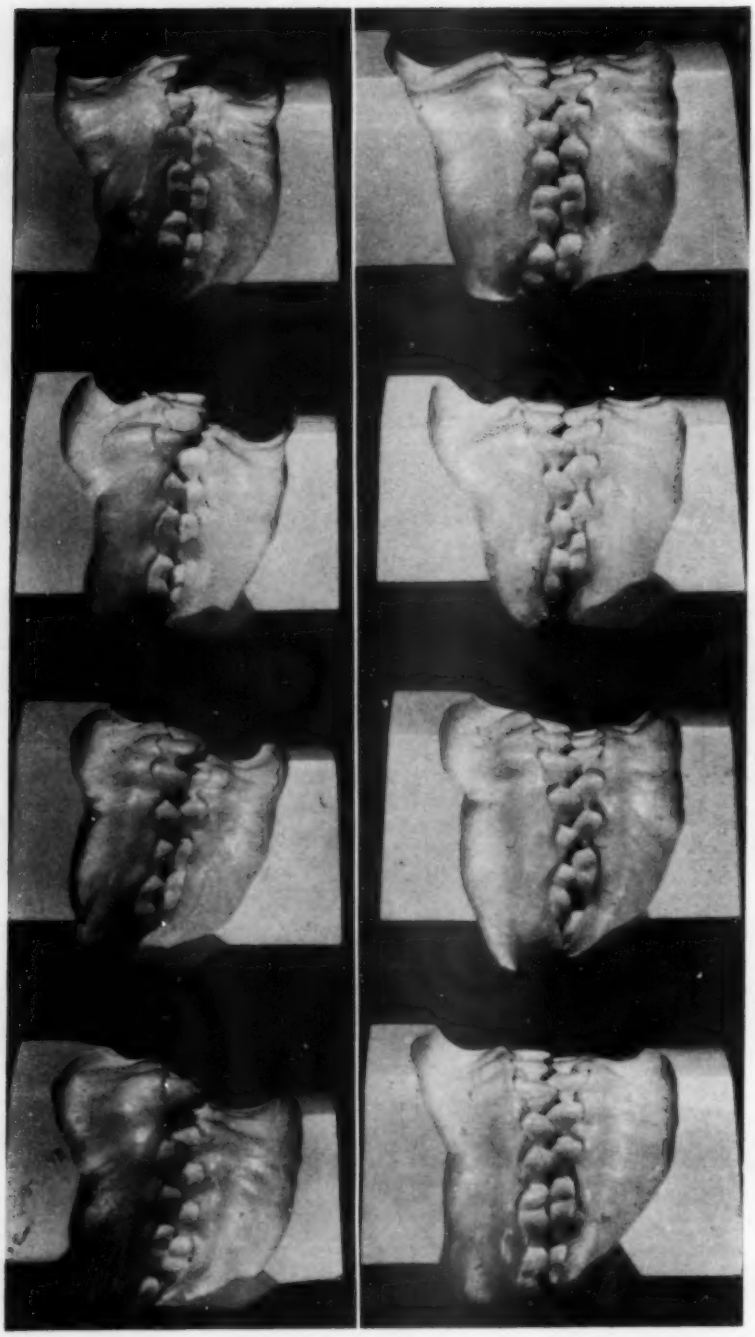


Fig. 31.—Group I. Correctly treated cases. Note that there is not a semblance of protrusion in these cases and that all the teeth are upright and over basal bone.

4. Virtually all malocclusions are characterized by a forward drift of the teeth in relation to their basal bones. Owing to lack of growth in the body of the mandible anterior to the rami, there is often a discrepancy between tooth anatomy and osseous basal structure which makes it impossible for all the teeth anterior to the first molars to assume normal positions on basal bone. Such a discrepancy may occur even when the first permanent molars are normally positioned with relation to basal bone. (Fig. 29.)

5. In the successful treatment of all Class I, Class II, and bimaxillary protrusion types of malocclusion, the mandibular incisors must be positioned in a normal relation to their basal bones. So positioned, they are in mechanical functional balance and best resist the forces of occlusion that will otherwise surely result in their displacement. (Figs. 30 and 31.)

6. The normal relationships of the mandibular incisor teeth to their basal bone is the most reliable guide in the diagnosis and treatment of all Class I, Class II, and bimaxillary protrusion types of malocclusion, and to the attainment of the objective of balance and harmony of facial lines and permanence of tooth positions. (Figs. 4, 5, 15, 27 and 28.) Such positioning of the teeth often requires the sacrifice of dental units. (Figs. 20, 21, 22, 23, 24, 25, and 26.)

7. By sacrificing all of the four first premolar teeth in the treatment of bimaxillary protrusion types of malocclusion, it is possible to achieve five of the six requirements for normal occlusion. If they are retained, the possibility of ever achieving more than two of the six requirements is lost. (Figs. 22, 23, 24, 25, and 26, middle figures.)

8. If the objectives of orthodontic therapy are (1) the best in facial esthetics, (2) a mechanically efficient masticating apparatus, (3) healthy investing tissues that will assure longevity of denture, and (4) permanency of tooth positioning, then, it is my opinion that it is necessary to remove dental units in more than 50 per cent of all cases that come to us for orthodontic treatment.

# THE LOWER THIRD MOLAR PROBLEM

FRED ROTHENBERG, D.D.S.,* NEW YORK, N. Y.

IN 1686 Charles Allen[1] published in Dublin the first dental book in English, *The Operator for the Teeth.* In this book, after describing the eruption of the permanent molars, he points out that "the four last of them seldom coming out before the one or two and twentieth of our age; for which reason such teeth are called by some, TEETH of WISDOM, because by that time we should have a full use of our rational FACULTY, though God knows how often it proves to be true."

He appears to be the first dentist to have expressed his ideas of the cause of impacted third molars:

1. "The gums are more sinewy and Membranous about them than anywhere else, and therefore much more difficult to Penetrate."

2. "That part of the Jaw-bone that contains them is likewise much thicker and stronger than any other; consequently, harder to be divided by the included Teeth."

He also explains the method by which they are finally erupted: "Nature having perfected our growth, the BLOUD becomes hotter, stronger, and its ENERGY more powerful by the firmness of the HEART . . . being able to surmount the resistance of the Jaw and Gums, forces the said Teeth to come out of their cells and grow Up." He is also writing of a technique to assist these teeth to erupt should the natural process be insufficient. The technique consisted of the use of a suction syringe which was applied to the gum overlying the third molar. The gingival tissue was sucked up into the cuplike opening of the instrument after having been prepared with "EMOLIENTS and RELAXING things," and kept there for a little while. Then this piece of tissue was cut away and the suction was repeated twice daily for two weeks. He says: "By this means it appears probable to me, that the gums yielding, the force of the BLOUD will compel the FIBRES or MINUTE parts of the imperfect tooth to advance according to their natural order and situation; and so cause the said Tooth to grow."

Since 1686, quite a lot has been written about the third molars or wisdom teeth. The writer doubts whether any other more ingenious technique has been described to help in the eruption of the third molar. Allen's technique of cutting away the overlying gum is still practiced today, however, with the exception of the suction syringe. The interest has become more concentrated upon the manifold symptoms and grave disturbances which were caused by the erupting third molar or by its partial or complete impaction. Many techniques have been devised and many new instruments have been designed for the removal of the third molar. The exodontist, the oral surgeon, and the orthodontist became mostly interested in the third molar problem, the first two from the viewpoint of its disturbances to the general health of the patient and of its removal, the

*Captain, D.C., U. S. Army.

latter from the viewpoint of its effect upon the normal dentition or its attributing factor to a malocclusion, or from the viewpoint of preventing its impaction by correcting an underdeveloped jaw.

The aim in dentistry is prevention: prevention of decay, of pyorrhea, of the early loss of a tooth, prevention of the loss of all teeth. This aim might be accomplished by a constant periodic examination of our patients, starting at their second or third year of life. Here the material is at the dentist's disposal to study the growth and development and eruption of the teeth. Here is a chance to discover which forces and factors are leading to disturbances in the normal sequence of eruption and to detect these disturbances at such an early stage that it might still be possible to guide the aberrant forces back to their normal path and prevent anomalies. A lot of pioneer work has already been done by men like Broadbent, Brodie, Diamond, Hellman, Schour, and others. Still a lot more has to be done and a lot more has to become known. The general practitioner can contribute a little by using his x-ray machine regularly and trying to find out how and in what directions the teeth are erupting, especially how the lower third molar, which might be called the greatest troublemaker, is behaving.

CASE 1.—A boy, 13 years and 9 months old, had his teeth x-rayed in 1938. He had a Class II malocclusion, and his parents were advised to have him undergo orthodontic treatment. The parents did not follow this advice. In 1943 x-rays were taken again and it was found that the third molars were completely impacted. The accompanying models show the Class II malocclusion.

Could it have been said in 1938, judging from the x-rays, the malocclusion, and the underdeveloped mandible, that the lower third molars were going to become impacted or that they would erupt normally if the malocclusion would be treated and a normal occlusion would be brought about, or that they would erupt in spite of the malocclusion?

Brun[2] quotes W. Kelsey Fry, who states in the *British Dental Journal,* April, 1933: "Nowadays when children are placed in the hands of a dentist for advice and attention regarding their teeth, surely it is his duty not only to take care of the immediate needs, but also to consider the probable future conditions. Can it be said that this duty has been well performed if it should be necessary for the patients, on reaching a more mature age, to undergo a complicated and difficult surgical operation for the removal of impacted wisdom teeth?"

Dr. Horace Davis, also quoted by Brun,[2] said in the *Journal of the American Dental Association,* May, 1932: "To find at the adult stage of life that impacted teeth are present and must be removed under adverse conditions is an indictment of our previous attention to this patient."

Are Dr. Fry and Dr. Davis right in assuming that an attentive dentist, seeing a child at regular intervals, can forecast what trend the development of the teeth and of the jaws will take?

Here are some additional cases:

CASE 2.—The first two x-rays are those of a 16-year-old girl. She had a Class I malocclusion and extreme crowding of the teeth. Both third molars were in a tipped position. Two years and eight months later, the second set of

x-rays was taken. The left third molar appeared to erupt normally, whereas the right third molar appeared to stay impacted.

CASE 3.—The first two x-rays are those of a 15-year-old girl, having a Class I malocclusion on the left side and Class II malocclusion on the right side. Both third molar teeth were not tipped as much as in the previous cases. Two years and six months later, both third molars had erupted almost completely.

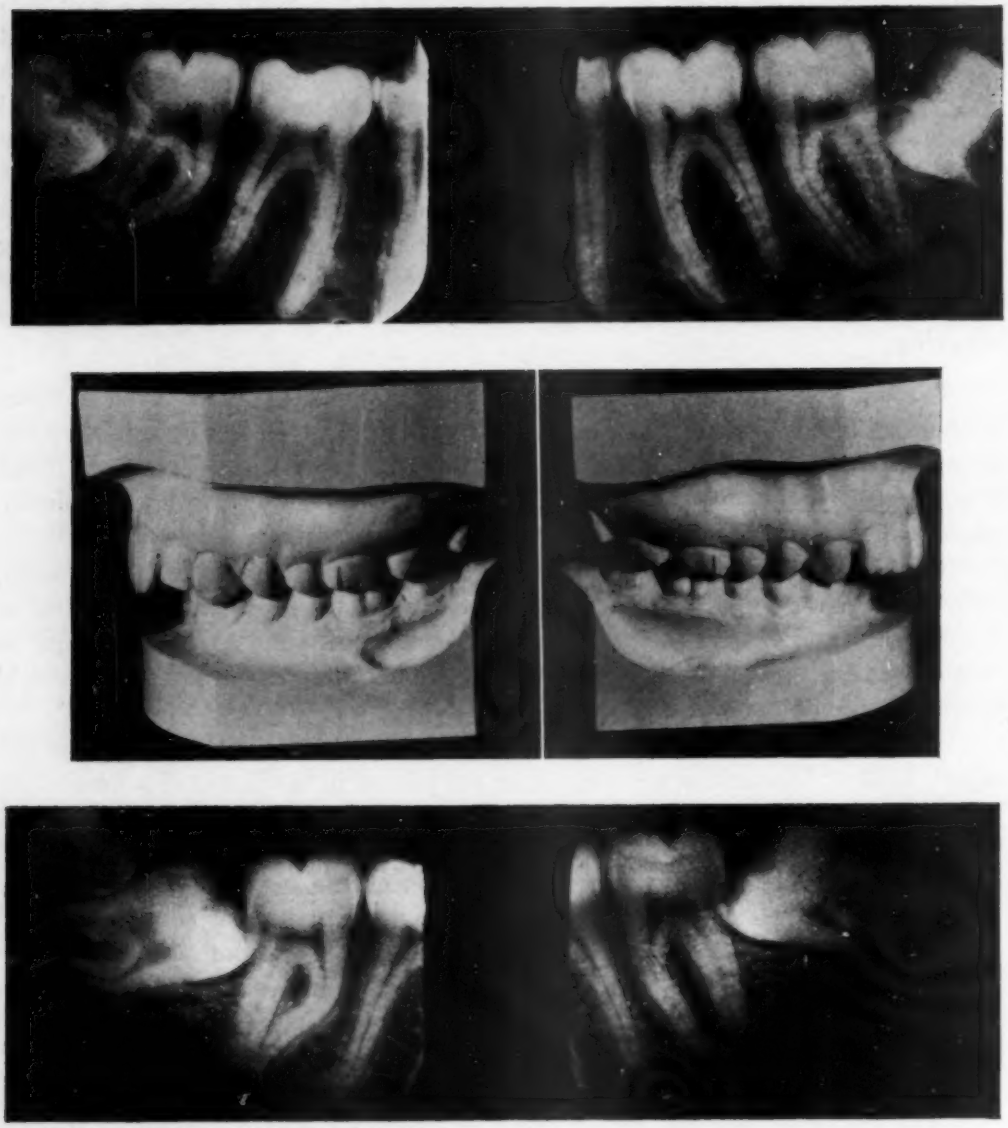


Fig. 1.—Case 1.

CASE 4.—The first two x-rays are those of a 14½-year-old girl, having a normal occlusion. The second set of x-rays was taken two years later, showing impaction of both third molars.

CASE 5.—A 25-year-old man had a normal occlusion and no crowding of teeth and no overbite. His third molars showed four different types of position:

two of them were completely impacted, one was partially impacted, and one was erupted.

What should the dentist have done in the first four of these cases? Shall he assume, as Milo Hellman[3, 4] does, that there is a trend in human evolution to suppress the third molar teeth and that this occurs in two ways? One is by delaying their eruption indefinitely and the other by eliminating them entirely.

Fig. 2.—Case 2.

Shall he therefore remove the third molars at an early developmental stage and thus do what Nature forgot to do in many cases? This theory of reduction is supported by the following reasons: Man, in his earliest stage of development, is supposed to have had a larger number of teeth than he has at present. Some of these teeth have been lost during his course of development. This cycle has not been completed yet. Formerly the tooth formula was: 3413/3143. This means 3 molars, 4 premolars, 1 canine, 3 incisors, 3 incisors, 1 canine, 4 pre-

molars, 3 molars. Today it is: 3212/2123, and the future formula will probably be 2111/1112 if the process continues. This forecast originates from the often observed lack of the germs of the maxillary lateral incisors and of the four third molars. Hellman considered the third molar impaction an associate phenomenon of retardation in the growth of the face.

If the dentist believes this to be right, nothing would be lost if he would systematically remove all third molars as early as possible and thus spare the patient the many unpleasant and annoying symptoms that might occur through the development and eruption or partial or complete impaction of the third molars.

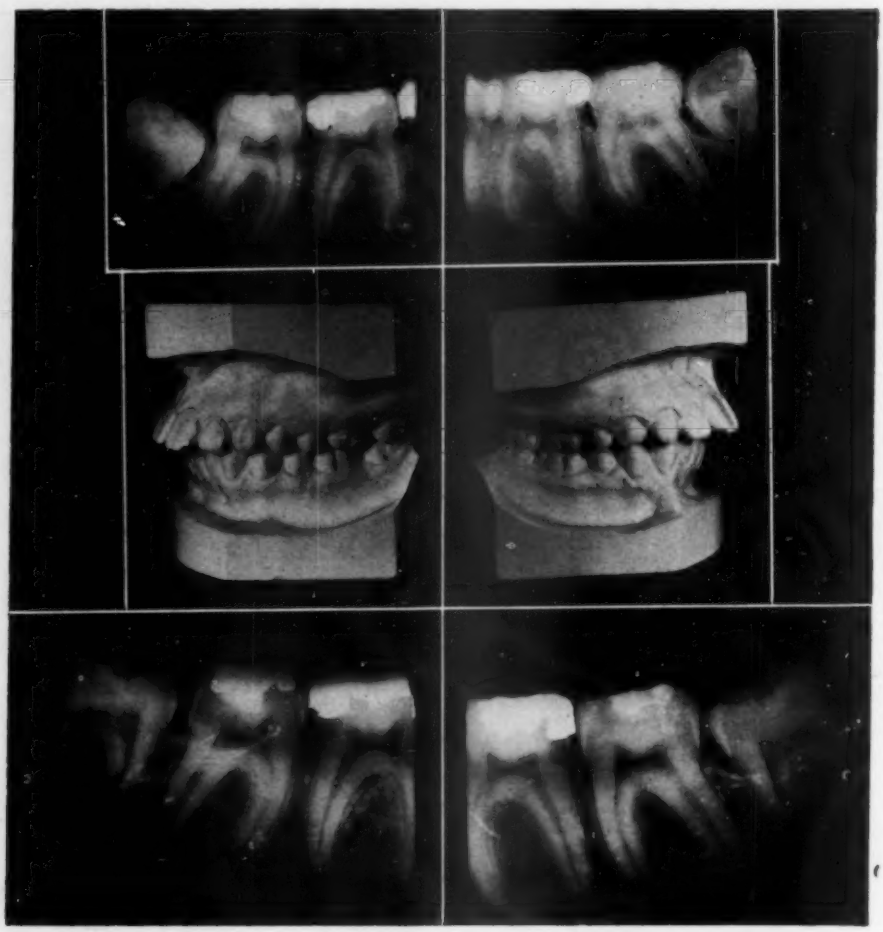


Fig. 3.—Case 3.

One might draw a parallel to the medical field: Is the physician removing every appendix just because a certain percentage of people will get appendicitis and a very small percentage of them might even die of it? Is he removing all tonsils just because they are subject to pathologic changes with more or less serious consequences for the entire organism? There used to be a time when such prophylactic removal of the tonsils and of the appendix was advocated and carried through systematically, but fortunately such practice is discontinued, partly because the role of either organ is not yet fully understood, and perhaps

partly because a certain respect for the laws of Nature, not always fully comprehended by man, influences one not to interfere with them.

We know now, according to Broadbent[5, 6] and Hellman[3, 4] that the third molars play an important part in the development of the jaws and the face, and therefore a systematic early removal, as it was practiced some years ago, is discontinued. Furthermore, the removal of the developing third molar bud is not always such an easy undertaking, because due to its round shape it tends to rotate in its socket and can be grasped only with great difficulty. One thought it easier therefore to remove the second molars instead. Fortunately, such practice is discontinued also, and no second molars are sacrificed to allow the eruption of the third molars.

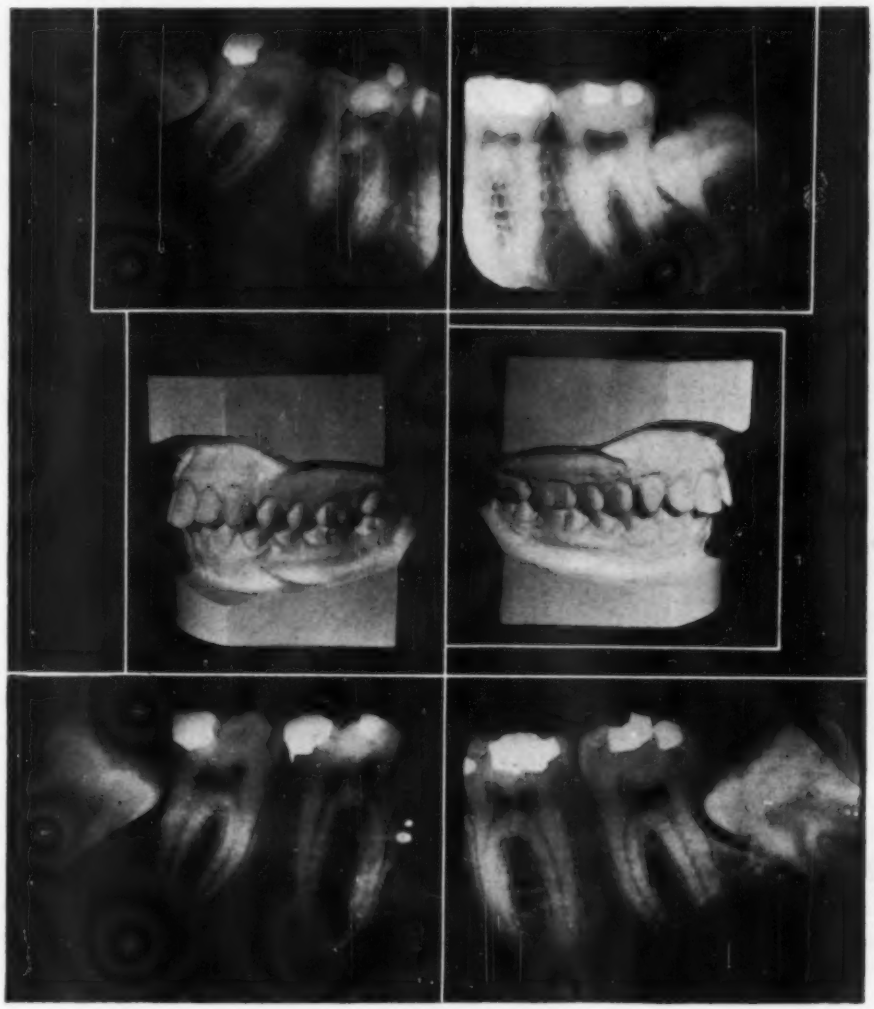


Fig. 4.—Case 4.

It can be said further that the theory of reduction cannot be accepted. Studies of Hellman and others, such as Euler[7] and Adloff,[8] covered only a range of time of not more than 5,000 to 10,000 years at the most. This is only a very short time for phylogenetic developments which will become finally so fixed that

the feature will be inherited and dominant. More than ten times as many years have to pass before any change of development may become dominant enough to occur in a great percentage of human beings. The author, in collaboration with R. Werther,[9] in a paper on anodontia showed that a theory brought forward by William Bateson for the occurrence of variations in the number of teeth is more correct. R. C. Osburn related Bateson's theory to the study of supernumerary teeth in the human dentition. G. V. Black, in 1909, presented a discussion of the theory on variations in the number of teeth and also rejected the reversion theory. Bateson said that supernumerary parts, such as fingers, toes, ribs, vertebrae, or teeth, are meristic or numerical variations which the serial structures are especially liable to. The congenital absence of teeth is also characteristic, phylogenetically, of serial structures. Osburn says, quoted by Diamond,[10] that teeth may be omitted from any part of a series, a fact for which reversion offers no explanation. Bateson characterizes them as discontinuous variations.

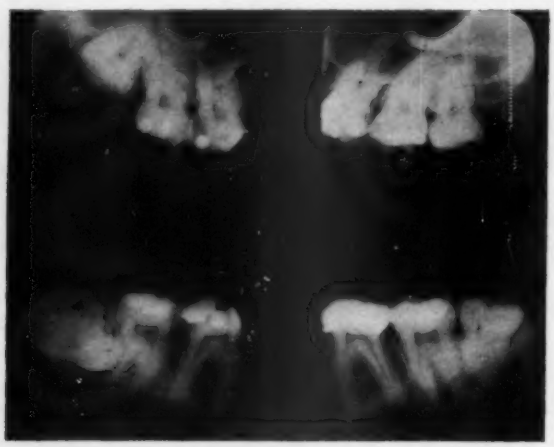


Fig. 5.—Case 5.

The congenital absence of teeth may also be explained on an ontogenic basis in terms of atrophic degeneration. Similarly there may be a partial atrophy of epithelial rods, producing underdeveloped teeth like the conical or peg-shaped lateral incisors, or like the rudimentary third molars in Case 6. The interesting fact in this case is that the left third molar is impacted even though sufficient room is present to allow for its upright position, especially because it is greatly below normal size.

Might we assume, therefore, that the presence of sufficient space supplied by the growth and development of the mandible is not the only prerequisite for a normal eruption of the third molar? Might we further say that this sufficient growth has to take place before a certain stage in the development of the tooth crown is reached?

What are further conclusions one might draw from the first four cases? Case 1 showed impaction, and one might say that the distoclusion and the accompanying under-development of the mandible might have been a contributing factor to the impaction. In Case 3 a unilateral distoclusion was present and the mandible is underdeveloped, yet both third molars are erupting. The tilted

position of the third molars in Case 1 and Case 2 are almost the same, yet there is a difference in age of two years and three months and also a difference in sex. This confirms Hellman's[3, 4] findings that the development of the third molars is not fixed to a certain chronological age, but that it varies with every individual and in each sex and that it is more in harmony with the general skeletal development of the individual. In Case 2 the girl is 16 years old, and in Case 3 the girl is only 15 years old, yet from the position of the third molars one might deduct that the growth of the mandible is further advanced in the younger person than in the older person; and in Case 4 the 14½-year-old girl has already attained the same stage of development which the girl in Case 2 has attained at 16 years of age. In Case 2 we have normal relationship of the first molars, but a crowded dentition, probably due to the fact that the size of the individual teeth do not harmonize with the size of the jaws, yet we have a unilateral impaction. In Case 4 we have a normally developed mandible, normal first molar relationship, and we find a bilateral impaction. Might we say therefore that the presence or absence of malocclusion has no direct bearing upon the eruption or impaction of the lower third molars? Might we further say that the forward tilt or the oblique position of the lower third molar crown before the eruption is an indication of an early stage in its development and is not a symptom of impaction? The position of the third molar changes with age, becoming either vertical or horizontal, both of which may lead to either impaction or eruption.

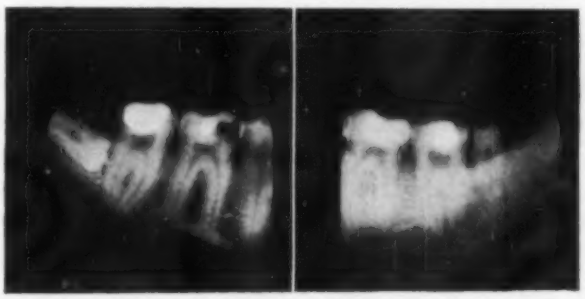


Fig. 6.—Case 6.

When are impactions really impactions and how are they to be recognized? There are two sets of conditions involved in the eruption of these teeth: one is the developmental movement or changes in the position of the crown, and the other the reaction to it of the tissues surrounding the tooth. If one of these conditions fails, the other alone does not complete the event. The question is: Are these conditions subject to local circumstances or are they the expression of other remote and more profound causes? The reason for teeth to become impacted is usually attributed to insufficient growth of the jaws or bone. It might better be called, insufficient growth of the mandible in relation to the development of the tooth. Could it be that the growth of the mandible might not take place symmetrically or could it be that the development of the individual tooth does not occur symmetrically on both sides? Case 7 shows such asymmetric development of the right and left third molars.

Growth of the jawbone and eruption of teeth are found to accompany each other in the course of development. Whether eruption of teeth is the cause of growth of the jawbone, whether growth of the jawbone is the cause of eruption of teeth, or whether both are brought about by some special growth-promoting agencies, has as yet not been clearly established. It is, however, reasonably certain that both growth of the jaws and eruption of the teeth are individual features associated with the general pattern of development, and that the growth and development of the mandible has to occur in a definite relationship to the growth and development of the tooth.

Fig. 7.—Case 7.

Salzmann[11] in his book, *Principles of Orthodontics,* says: "As shown originally by Hunter (1772) in his experiments on madder fed pigs and confirmed later by Brash, Schour and others, the mandible does not grow in size by interstitial growth, but increases in length by addition (surface apposition) at the posterior margin of the ramus and resorption at its anterior margin. Growth in width of the mandible is obtained by lateral apposition on the outer plate and resorption on the inner surface. Growth in height is obtained by considerable growth at the alveolar border which grows in an outward, upward and forward direction and by additions along the lower border. There is a growth area in the mandible along the junction between the body and the ramus. The ramus apparently becomes resorbed on its internal angle, allowing more room for teeth, and added bone growth takes place on the external border of the ramus, making the mandible longer. The alternating influences of increase in size and adjustment of parts occurring in this area allow additional room for the molar teeth to erupt and control the axial inclination of the last developing molars."

Schour,[12] in his study of growth of the mandible, injected animals intraperitoneally with alizarin red "S" at different growth stages. The first stage was corresponding to the deciduous dentition, the second stage (6 years) was corresponding to the mixed dentition, and the third stage was corresponding to the adult dentition in man. He found growth occurring everywhere on the mandible in the first stage. In the second stage the generalized type of growth

had nearly disappeared and certain "sites" of growth had appeared. One was located at the head of the condyle and others were present along the entire length of the posterior border of the ramus, the sigmoid notch, and along the alveolar crest. There were a few traces of growth noticeable on the lateral surfaces. At the third stage, bone growth was found at the same sites where it was at the second stage, but to a diminished degree.

Therefore, the directions of growth in the mandible are upward at the alveolar process, backward at the ramus, and upward and backward at the condyle. This is just the opposite of what was found from the study of serial roentgenograms taken in a similar study by Brodie.[13, 14] They showed a downward and forward movement of the mandible throughout its growth. Brodie also maintains that the angle formed by the ramus with the posterior border remains constant throughout growth, instead of becoming more acute as has been thought in the past.

At birth the crypt of the permanent lower first molar is lying in the ramus of the mandible in a slightly inclined position toward the second deciduous molar. At about 3 years of age, the first molar bud seems to have moved forward and downward, and the crypt of the second molar appears in the ramus at the same spot formerly occupied by the first molar and also in an inclined position. This tooth also seems to move gradually forward and downward with the development and growth of the mandible, and the crypt of the third molar appears in the ramus again in a tilted position, which, with progressing age, seems to move downward and forward in order to erupt finally. Broadbent[5, 6] uses the term: they "wiggle" into position. In reality, these teeth do not move downward or forward, but they become gradually exposed during the backward growth of the mandible, which takes place by resorption of bone from the anterior border of the ramus and by apposition of bone at the posterior border of the ramus. The three posterior molars are actually only moving in a vertical direction, that means straight up, in order to erupt (Brodie[13, 14]).

If one measures the distance of the last molar in occlusion from the posterior margin of the ramus on a line parallel to the occlusal plane as soon as possible after occlusion with its antagonist has been established, one will obtain the same reading for the second deciduous and first and second permanent molars. Each succeeding molar erupts at the same distance from the posterior margin of the ramus (Brodie[13, 14]).

If the development and growth of the third molar crypt is not correlated to the deposition and resorption of bone at the ramus, and the change in inclination of the third molar crown is not correlated with both, the tooth cannot erupt normally and will become impacted. The degree of impaction and the angle of the impaction is influenced by the amount of discrepancy between these three different developmental processes. The fact that variations occur with regard to the right and left side, as in Cases 2, 5, and 6, might be explained by the fact that the development of the third molar tooth, as well as of any other tooth, does not go on equally fast bilaterally, but is also subject to variations as shown in Case 7, or that development and growth of the bone is not equal on both sides. Apparently, this entire development is taking place during the formation of

the crown portion of the tooth. The development of the root portion seems to be a separate process and does not seem to influence the position of the tooth toward its eruption or impaction.

## CONCLUSIONS

The author does not agree with Dr. Fry or Dr. Davis that the dentist should be indicted of a lack of attention or of a badly performed duty if he finds that his patients, after having reached a more mature age, have to undergo a complicated and difficult surgical operation for the removal of impacted wisdom teeth.

It can be said that it is impossible to predict what course the growth and development of the face, jaws, and teeth will take. We know from the studies of Brodie,[13, 14] Broadbent,[5, 6] Schour,[12] and Diamond,[10] what is normal facial development. Broadbent[5] also says that individuals, in spite of early handicaps to their growth and development, may recover and ultimately attain sufficient size and proportions to accommodate in normal occlusion their full complement of teeth.

One cannot predict from the position of the developing mandibular third molar whether it will erupt or become impacted.

The tilted position of the tooth bud does not indicate a later impaction but is a sign of its early developmental stage.

Early removal of the third molar bud, to spare the patient a complicated and difficult operation at a later time, is not recommended, nor the removal of any molar tooth mesial to the third molar to assure its eruption.

The reversion theory for the delayed eruption of third molars or their congenital absence cannot be accepted. Bateson's theory of variations in numbers of serial structures is more plausible.

The presence of the third molars is necessary to bring about a normal and harmonious development of the mandible and of the face.

The presence or absence of malocclusion has apparently no bearing upon the eruption or impaction of the third molar.

The size of the third molar tooth, especially if abnormally small, does not prevent its impaction.

The molar teeth do not "wiggle" downward and forward into the mandible and finally erupt. They are gradually exposed during the growth of the mandible. The only movement of the molar teeth is upward.

There are four factors involved in the eruption of mandibular third molars:

1. The development and growth of the mandible.
2. The development and growth of the crown portion of the tooth.
3. The change in the inclination of the crown.
4. A sequential interrelated growth of all factors and phenomena involved.

The author is greatly indebted to Dr. Moses Diamond of Columbia University, School of Dental and Oral Surgery, for his guidance and direction.

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107 PAYSON AVENUE

## Postponement of Meeting of the American Association of Orthodontists for 1945

On Wednesday, January 10, President Archie B. Brusse, of Denver, Colorado, sent the following telegram to each member of the Board of Directors of the American Association of Orthodontists:

> IN SUPPORT OF THE JAMES F. BYRNES MEMORANDUM REGARDING CONVENTIONS IT IS MY RECOMMENDATION THAT OUR AMERICAN ASSOCIATION OF ORTHODONTISTS MEETING SCHEDULED AT COLORADO SPRINGS IN MAY BE CANCELLED. KINDLY LET ME HAVE YOUR VOTE IMMEDIATELY.

The response to the telegrams was unanimous, all directors voting for a cancellation of the meeting. It seems that the time has arrived when all large groups must get in line and cooperate 100 per cent with the War Production Board, Office of Defense Transportation, War Manpower Commission, and other functioning war organizations.

This meeting was to be held in Colorado Springs, May 21, 22, 23, and 24 at the luxurious Broadmoor Hotel. The Colorado committees have been making extensive plans for the meeting, and it is to be hoped that after the emergency has passed a more successful gathering may be held than had originally been planned.

*H. C. P.*

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**Max E. Ernst, Secretary, American Association of Orthodontists, 1250 Lowry Medical Arts Bldg., St. Paul, Minn.**

# Department of Orthodontic Abstracts and Reviews

Edited by

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**Localised Vertical Growth Disturbance**: By Philip G. Capon, L.D.S., Liverpool, *Dental Record* **64**: 127-134, June, 1944.

This discussion centers around the opening of the occlusion in the deciduous teeth when a successor is present, and not when there is a congenital absence of the permanent teeth.

Izard and Dorian consider this irregularity one of secondary retention, a term which Ballard favors. They use the description of a retreat of the tooth into the tissues, this movement being influenced by pressure from the bulbous form of the approximal teeth.

In my view this theory on the commencement of the abnormality cannot apply because if one studies the models and x-rays of the case it will be seen that the deciduous teeth are spaced when the evidence was first seen. It may be that these writers also studied advanced cases when the approximal teeth have probably increased the impaction.

*Teeth Affected.*—It is peculiar that so far in my private practice the abnormality was usually noticed in $\overline{d}|$ or $\overline{d}|$ and if the deformity progressed, in the $\frac{e, d \mid d, e}{e \mid e}$ in quick succession.

All writers seem to suspect that ankylosis is the primary cause. This theory is based on the study of the few cases which could be obtained for sectioning.

It has been my experience that the absorption rate is faster than normal in this condition, whereas, in delayed loss of deciduous teeth it is the reverse. Accordingly, one might suspect ankylosis in the latter case. In such cases the occlusion is not open. It is accepted that a deciduous tooth commences to absorb about three years before its exfoliation. If osseous union were the sole cause of the abnormality, this would not explain a number of my cases, because the evidence first appeared at such an early age.

In view of the fact that osseous union is not always present, it is possible to conjecture even if an ankylosis did exist it might have no bearing on the problem.

From the clinical material I have so far obtained, the theory of the alveolus carrying the teeth into position appears reasonable. We know that a child has definite physical growth periods, and that these synchronize roughly with the various incisal, premolar, and molar area eruptions.

Does this phenomenon therefore have any bearing on that familiar condition of closed bite, which we attempt to correct by bite plate or intermaxillary

traction? From the gross examples I have seen this would be possible, but where a single tooth is involved the remaining alveolar height is fully maintained.

*Treatment.*—Bearing in mind that the absorption rate has been good, I have only removed teeth when any impaction has delayed exfoliation. The deciduous teeth, even in their infraclusion, keep some spacing, and as I have not had much faith in the ankylosis theory, I have felt there was not much risk in retaining the teeth. So far I appear to have been justified in this assumption, and where the deciduous teeth were exfoliated or extracted at about normal time no complications have occurred.

I have arrived at the following conclusions:

1. The deformity is first noticed at such an early age that serious movement of the successor tooth can hardly have begun.

2. The failure of the deciduous tooth to keep in line with the occlusion is, therefore, primarily due to a retarded alveolar development, rather than an interference with the mechanism of the erupting tooth.

3. Mouth health appears to be always above average.

4. There is no need to interfere surgically until about the time of full exfoliation of the deciduous tooth because its successor always erupts to a normal level.

# News and Notes

## American Association of Orthodontists

The meeting of the American Association of Orthodontists, which was to have been held in Colorado Springs, May 21-24, 1945, has been cancelled.

MAX E. ERNST, Secretary, 1250 Lowry Medical Arts Building, St. Paul 2, Minnesota.

## American Board of Orthodontics

The American Board of Orthodontics announces the cancellation of the meeting formerly scheduled for May 17, 18, 19, and 20, 1945, at the Broadmoor Hotel, Colorado Springs, Colorado.

Notice of the time and place of its next meeting will be given all applicants and those who are preparing material for examination by the Board. Orthodontists who may desire information relative to certification by the Board may address the Secretary, Dr. Bernard G. deVries, 705 Medical Arts Building, Minneapolis, Minnesota.

## New York Society of Orthodontists

The annual meeting of the New York Society of Orthodontists, which was to have been held on March 5 and 6, 1945, has been cancelled, according to Norman L. Hillyer, Secretary.

## Chicago Dental Society

The midwinter meeting of the Chicago Dental Society has been cancelled, according to recent word sent out by the Society.

## Tribute to Dental Officers

The following is from a personal letter written to Major General R. H. Mills, U.S.A., Director, Dental Division, by Major Paul E. Edson, D.C., "Somewhere in the Philippines."

"The Medical service has been praised highly for its front line action and for the speedy evacuation of casualties, through impossible roads and swamps. In many cases the wounded soldier was actually amazed at the thoroughness and speed with which he was treated.

"I want to specifically mention the work of Captain Melvin P. Lager, D.C., of our Engineer Battalion, and Captain Arthur R. Plith, D.C., of the Division Artillery. Both of these officers left their foxholes in the midst of bursting Japanese shellfire to aid the wounded. Captain Lager has had complete charge of his medical detachment since the operation began.

"Another officer, Captain Nicholas Sanoff, has performed the duties of Surgeon for an Infantry Battalion during the entire operation. So I cannot help but feel proud of these officers of the Dental Corps."

## New York Institute of Clinical Oral Pathology

The New York Institute of Clinical Oral Pathology will hold its One Hundredth Monthly Conference at the New York Academy of Medicine on Monday evening, April 30, 1945.

The subject of the meeting will be "A Survey of the Antibiotic Problem." This will be discussed by members of the medical and dental professions from both the theoretical and clinical standpoints.

Members of the medical, dental, public health, and other professional groups are cordially invited. For further information, address all communications to the Executive Secretary, 101 East 79th Street, New York 21, N. Y.

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## Notes of Interest

Dr. I. M. Halperin is now located at 4700 Bergenline Avenue, Union City, New Jersey, and 843 Queen Anne Road, Teaneck, New Jersey. Practice limited to orthodontics.

Russell E. Huber, B.S., D.D.S., M.S., announces the opening of an office at 660 Fidelity Medical Building, Dayton, Ohio. ADams 4554. Practice limited to orthodontics.

Dr. David Mossberg is now located at 36 West 59th Street, New York 19, New York. Plaza 3-7611, 3-6180. Practice limited to orthodontics.

Raymond L. Webster, D.M.D., and Donald D. Osborn, D.M.D., announce the removal of their offices to 133 Waterman Street, Providence, Rhode Island. Gaspee 0655. Practice limited to orthodontics.

Dr. Lee O. Rogers, 404-5 Petroleum Building, Big Spring, Texas, wishes to announce that in the future his practice will be limited to orthodontics.

## OFFICERS OF ORTHODONTIC SOCIETIES*

### American Association of Orthodontists

*President,* Archie B. Brusse - - - - - - - - - - 1558 Humboldt St., Denver, Colo.
*President-Elect,* Earl G. Jones - - - - - - - - - 185 East State St., Columbus, Ohio
*Vice-President,* Will G. Sheffer - - - - - - - - Medico-Dental Bldg., San Jose, Calif.
*Secretary-Treasurer,* Max E. Ernst - - - 1250 Lowry Medical Arts Bldg., St. Paul, Minn.

### Central Section of the American Association of Orthodontists

*President,* Arthur C. Rohde - - - - - - - - 324 E. Washington Ave., Milwaukee, Wis.
*Secretary-Treasurer,* L. B. Higley - - - - - - - 705 S. Summit St., Iowa City, Iowa

### Great Lakes Society of Orthodontists

*President,* Willard A. Gray - - - - - - - - - Medical Arts Bldg., Rochester, N. Y.
*Secretary-Treasurer,* C. Edward Martinek - - - - - 661 Fisher Bldg., Detroit, Mich.

### New York Society of Orthodontists

*President,* Raymond L. Webster - - - - - - - - - 155 Angell St., Providence, R. I.
*Secretary-Treasurer,* Norman L. Hillyer - - - - - Professional Bldg., Hempstead, N. Y.

### Pacific Coast Society of Orthodontists

*President,* J. Camp Dean - - - - - - - - - - - 1624 Franklin St., Oakland, Calif.
*Secretary-Treasurer,* Earl F. Lussier - - - - - - 450 Sutter St., San Francisco, Calif.

### Rocky Mountain Society of Orthodontists

*President,* Henry F. Hoffman - - - - - - - - - 700 Majestic Bldg., Denver, Colo.
*Secretary-Treasurer,* George H. Siersma - - - - - 1232 Republic Bldg., Denver, Colo.

### Southern Society of Orthodontists

*President,* M. Bagley Walker - - - - - - - - - 618 Medical Arts Bldg., Norfolk, Va.
*Secretary-Treasurer,* E. C. Lunsford - - - - - - - 2742 Biscayne Blvd., Miami, Fla.

### Southwestern Society of Orthodontists

*President,* Harry Sorrels - - - - - - - - Medical Arts Bldg., Oklahoma City, Okla.
*Secretary-Treasurer,* James O. Bailey - - - - - Hamilton Bldg., Wichita Falls, Texas

### American Board of Orthodontics

*President,* Frederic T. Murlless, Jr. - - - - - - 43 Farmington Ave., Hartford, Conn.
*Vice-President,* Joseph D. Eby - - - - - - - - 121 E. 60th St., New York, N. Y.
*Secretary,* Bernard G. deVries - - - - - - - - Medical Arts Bldg., Minneapolis, Minn.
*Treasurer,* Oliver W. White - - - - - - - - 213 David Whitney Bldg., Detroit, Mich.
James D. McCoy - - - - - - - - 3839 Wilshire Blvd., Los Angeles, Calif.
Claude R. Wood - - - - - - - - - Medical Arts Bldg., Knoxville, Tenn.
James A. Burrill - - - - - - - - 25 E. Washington St., Chicago, Ill.

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### Harvard Society of Orthodontists

*President,* Max Abrams - - - - - - - - - - - 184 Shirley Ave., Revere, Mass.
*Secretary-Treasurer,* Edward I. Silver - - - - - - 80 Boylston St., Boston, Mass.

*The Journal will make changes or additions to the above list when notified by the secretary-treasurer of the various societies. In the event societies desire more complete publication of the names of officers, this will be done upon receipt of the names from the secretary-treasurer.

### Washington-Baltimore Society of Orthodontists

*President,* Meyer Eggnatz - - - - - - - - - - - Medical Arts Bldg., Baltimore, Md.
*Secretary-Treasurer,* William Kress - - - - - - - Medical Arts Bldg., Baltimore, Md.

## Foreign Societies*

### British Society for the Study of Orthodontics

*President,* S. A. Riddett - - - - - - - - - - - 42 Harley St., London, W. 1, England
*Secretary,* R. Cutler - - - - - - - - - - 8 Lower Sloane St., London, S.W. 1, England
*Treasurer,* Harold Chapman - - - - - - 6 Upper Wimpole St., London, W. 1, England

### Sociedad de Ortodoncia de Chile

*President,* Alejandro Manhood - - - - - - - - - - - - - - Avda. B. O'Higgins 878
*Vice-President,* Arturo Toriello - - - - - - - - - - - - - - - - Calle Londres 63
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*Treasurer,* Pedro Gandulfo - - - - - - - - - - - - - - - - - - Calle Londres 63

### Sociedad Argentina de Ortodoncia

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### Sociedad Peruana de Ortodoncia

*President,* Augusto Taiman
*Vice-President,* Ricardo Salazar
*Secretary,* Carlos Elbers
*Treasurer,* Gerardo Calderon

*The Journal will publish the names of the president and secretary-treasurer of foreign orthodontic societies if the information is sent direct to the editor, 8022 Forsythe, St. Louis 5, Mo., U. S. A.